

An Introductory Guide to Hacking Nintendo World Cup

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Introduction

Nintendo World Cup is a localization of the game Nekketsu Koukou Dodgeball-bu Soccer-hen, produced by Technos. The Japanese version is quite different from the U.S. and European versions in that you can only control the Nekketsu team in Tournament Mode. Furthermore, you initially begin with six players, and four more join the team as you progress. The U.S. and European versions give you eight players from the beginning of the tournament; the other two players are not accessible, although all of their data—except names—are still present in the respective ROMs. The information contained in this document pertains to the U.S. version, but I assume that the European version is very similar. I also assume that the reader is familiar with the game, so I will not explain basic information such as controls.

Conventions

All values and offsets listed in tables are hexadecimal unless indicated otherwise. All values and offsets listed in the text are decimal unless prefixed by 0x or \$, in which case they are hexadecimal. Nintendo World Cup is a mapper 4 (MMC3) game. This mapper uses 1-KiB CHR-ROM banks, so any reference to a CHR-ROM bank in this document means 1 KiB.

Table 1: Basic Statistics

Table 1 lists some basic statistics for each team. Although the player names are different depending on which country you choose in the tournament, the health and speed of the players on your team are the same as those listed for the U.S.A. The super kick and the number of steps required for the super kick, however, are those for the team you are controlling. When playing against the U.S.A. in Tournament Mode, it will have the health and speed of the team you are controlling. In VS Match Mode, the players have the health, speed, super kicks, and required steps of their respective team. “Joe” and “Bob” are the two inaccessible players in Tournament Mode. In VS Match Mode, Phil and Fred are not accessible, either.

Health: When a player’s health reaches zero, he will not get up after being hit by a tackle or a slide until a goal is scored. Health is reset after each half of a match.

Super Kicks: You can perform a super kick by hitting the ball with a bicycle kick, hitting an air ball with a header before it touches the ground, or taking the required number of steps before shooting. You do not need to have the ball in possession while taking those steps. The CPU teams can apparently perform super kicks at will. They also have a seemingly unlimited number of super kicks, while human players each have five per half of a match. After the five are exhausted, a high-speed turbo kick can be performed, but only by taking the required number of steps before shooting. Your CPU-controlled teammates never perform super kicks. The value listed for the U.S.A. team is the super kick that it uses when you play against it in Tournament Mode.

Table 1: Basic statistics

Team	Health		Speed		Super Kick		Steps	
	Offset	Value	Offset	Value	Offset	Value	Offset	Value
U.S.A.					1B563	89		
Tony	9B08	32	1A0DD	6	1B55A	80	1B570	7
Dayv	9B09	28	1A0DE	2	1B55B	84	1B571	3
Brian	9B0A	26	1A0DF	2	1B55C	85	1B572	3
Terry	9B0B	28	1A0E0	8	1B55D	82	1B573	7
Mark	9B0C	28	1A0E1	4	1B55E	81	1B574	7
Don	9B0D	28	1A0E2	2	1B55F	89	1B575	3
Phil	9B0E	3C	1A0E3	4	1B560	86	1B576	7
Fred	9B0F	32	1A0E4	8	1B561	87	1B577	7
“Joe”	9B10	37	1A0E5	6	1B562	88	1B578	7
“Bob”	9B11	3C	1A0E6	8	1B563	89	1B579	3
Holland	9B12	30	1A0E7	4	1B564	8C	1B57A	7
Japan	9B13	18	1A0E8	0	1B565	80	1B57B	3
France	9B14	20	1A0E9	2	1B566	8C	1B57C	3
Cameroon	9B15	16	1A0EA	0	1B567	87	1B57D	5
Russia	9B16	26	1A0EB	0	1B568	8D	1B57E	5
Mexico	9B17	2C	1A0EC	4	1B569	94	1B57F	7
England	9B18	26	1A0ED	5	1B56A	82	1B580	5
Spain	9B19	22	1A0EE	3	1B56B	87	1B581	5
Brazil	9B1A	32	1A0EF	6	1B56C	81	1B582	5
W. Germany	9B1B	46	1A0F0	A	1B56D	86	1B583	5
Argentina	9B1C	3C	1A0F1	13	1B56E	94	1B584	9
Italy	9B1D	32	1A0F2	A	1B56F	89	1B585	9

Table 2: Team Statistics

VS Match Mode: The offsets in the Pointer column are two-byte pointers used by the game to determine where the team names start. The offsets in the Name column contain the names of the teams as displayed on the “Change positions?” screen of VS Match Mode. For some reason, Cameroon is called “Kanya” (or would be if it were available in VS Match Mode). The other names are unchanged.

Player Names: Eight player names are stored for each team. Each name can be up to 6 characters long, but 12 bytes are used for each name in the ROM file. The first six bytes are generally 0x00, which indicates a blank tile. Accents and other diacritical marks may also be stored in these bytes. For example, the umlaut in the name Günter for the West German team is stored in the first six bytes. The second group of six bytes holds the characters of the player’s name. When drawn to the screen, the tiles indicated by the first group of six bytes are placed above the tiles indicated by the second group. Only the first six names from each team are used in VS Match Mode.

Defenders: These offsets determine the number of defenders the indicated team sends against you in Tournament Mode.

Defense: These offsets determine what type of defense the indicated team uses against you in Tournament Mode. The 0x00 and 0x01 defense types have the defenders near the goal, while the 0x02 defense type has the defenders near the halfway line.

Table 2: Team statistics

Team	VS Match Mode			Defenders		Defense	
	Pointer	Name	Player Names	Offset	Value	Offset	Value
U.S.A.	E031	E04B	E0D9	18757	1	198F2	0
Holland	E033	E053	E139	18758	3	198F3	1
Japan	E035	E05C	E199	18759	2	198F4	0
France	E037	E065	E1F9	1875A	2	198F5	2
Cameroon	E039	E06E	E259	1875B	1	198F6	1
Russia	E03B	E077	E2B9	1875C	2	198F7	0
Mexico	E03D	E080	E319	1875D	3	198F8	0
England	E03F	E089	E379	1875E	3	198F9	2
Spain	E041	E092	E3D9	1875F	2	198FA	2
Brazil	E043	E09B	E439	18760	3	198FB	0
W. Germany	E045	E0A4	E499	18761	3	198FC	2
Argentina	E047	E0AD	E5F9	18762	3	198FD	1
Italy	E049	E0B6	E659	18763	3	198FE	2

Table 3: Team Graphical Information

Flag: The offsets in the Pointer column determine which CHR-ROM bank contains the national flag of the respective team. The Tiles column presents the offset in the ROM to the first tile of the flag data. Each flag animation consists of four sprites, and each sprite is four tiles long by three tiles tall. Thus, add 0x100 or 0x200 to the offset in Table 3 to get the offset to the first tile of the second or third row, respectively, of each flag. To get the offset to the first tile of the second, third, or fourth sprite, add 0x40, 0x80, or 0xC0, respectively, to the offset in Table 3.

Name: The four CHR-ROM banks beginning at 0x26010 in the ROM are placed into the background pattern table whenever the team names are drawn. Tiles for the team names actually take up the first three banks, while the fourth contains tiles used during halftime of each match or during VS Match Mode. The offsets in the Pointer column of Table 3 contain two bytes of information for each team: The first byte tells how many tiles to read for one row of the team name (each team name consists of two rows of tiles), and the second byte is a pointer to the tile in the background pattern table at which to start reading. The Tiles column presents the offset in the ROM to the first tile of the first row of the corresponding team name. To get the offset of the first tile of the second row, just add 0x100 to the offset in the Tiles column.

Heads: These offsets determine which CHR-ROM bank is used to display the soccer ball and the

upper head tiles for players on the field. There are thirteen bytes of information for each team. The first byte is the pointer for which bank to use when playing against the U.S.A., the second is the pointer for which bank to use when playing against Holland, and so on. Only the pointers for the U.S.A. are used in Tournament Mode. In VS Match Mode, the other pointers are also used. Note that most of the non-U.S.A. pointers are 0x00, which is not a valid bank for the tiles needed.

Commands: These are the offsets to the tiles for the upper portions of the player faces. They are displayed when you give commands to your teammates. Each face consists of two tiles. The tiles for the lower half of the face begin at offset 0x2E030. The same two tiles are used for the lower half of the face regardless of what team you choose.

Table 3: Team graphical information

Team	Flag		Name		Heads	Commands
	Pointer	Tiles	Pointer	Tiles		
U.S.A.	82B0	36C10	EC64	262A0	1D39A	2E050
Holland	82B1	35010	EC66	26810	1D3A7	2E850
Japan	82B2	35410	EC68	26660	1D3B4	2E3D0
France	82B3	35810	EC6A	26A10	1D3C1	2E250
Cameroon	82B4	36810	EC6C	26A80	1D3CE	2E310
Russia	82B5	34810	EC6E	26890	1D3DB	2E610
Mexico	82B6	36410	EC70	260A0	1D3E8	2E550
England	82B7	34C10	EC72	26020	1D3F5	2E490
Spain	82B8	37010	EC74	26610	1D402	2E6D0
Brazil	82B9	36010	EC76	26410	1D40F	2E910
W. Germany	82BA	35010	EC78	26470	1D41C	2E790
Argentina	82BB	35C10	EC7A	26210	1D429	2E190
Italy	82BC	35810	EC7C	266C0	1D436	2E9D0

Tables 4 and 5: Palettes

All of the palette information in Tables 4 and 5 is stored in a similar format. Offsets in the Pointer columns contain two-byte pointers used by the game to determine where the palettes begin, while offsets in the Data columns contain the actual palette information.

Players: Each palette consists of six bytes:

- Byte 1: The hair color of the players on the team. It is also the outline color for the player indicators, such as the number 1 above the player's head on the field and the Roman numeral I on the miniature map at the bottom of the screen.
- Byte 2: The eye color of the players on the team. It is also the inner color of the player indicators and the color used to draw the text and boxes at the bottom of the screen. This byte is 0x30 (white) for all teams.
- Byte 3: The skin color of the players' upper face; the face data is stored separately from the data

for the rest of the body (Byte 6).

Byte 4: The color used to outline the body of each player. It is also the color of the pentagons on the soccer ball.

Byte 5: The color of the team uniform.

Byte 6: The skin color of the rest of the players' bodies. It is also the color for the rest of the soccer ball. This byte has the same value as byte 3 for all teams.

Flag: Each palette consists of sixteen bytes, but only bytes 2–4 and 6–8 determine the actual flag colors. Bytes 6–8 are actually the same as bytes 2–4 for all teams. The other bytes are presumably colors for other graphics on the screen displayed when you win the tournament.

Fields: Each palette consists of eight bytes, the purposes of which vary depending on the field type.

Table 4: Team palettes

Team	Players		Flag	
	Pointer	Data	Pointer	Data
U.S.A.	1D14E	1D16A	1D5C0	1D81C
Holland	1D150	1D170	1D5C2	1D82C
Japan	1D152	1D176	1D5C4	1D83C
France	1D154	1D17C	1D5C6	1D84C
Cameroon	1D156	1D182	1D5C8	1D85C
Russia	1D158	1D188	1D5CA	1D86C
Mexico	1D15A	1D18E	1D5CC	1D87C
England	1D15C	1D194	1D5CE	1D88C
Spain	1D15E	1D19A	1D5D0	1D89C
Brazil	1D160	1D1A0	1D5D2	1D8AC
W. Germany	1D162	1D1A6	1D5D4	1D8BC
Argentina	1D164	1D1AC	1D5D6	1D8CC
Italy	1D166	1D1B2	1D5D8	1D8DC

Table 5: Field palettes

Field	Pointer	Data
Grassy	1D0FE	1D10E
Soil	1D100	1D116
Concrete	1D102	1D11E
Sand	1D104	1D126
Ice	1D106	1D12E
Bumpy	1D108	1D136

Other Offsets

VS Match Mode: The five bytes beginning at 0xD77A determine which teams are available in VS Match Mode. For example, 0x00 is U.S.A., 0x01 is Holland, and so on.

Passwords: Tournament Mode passwords begin at 0xF095 in the ROM. That is, the password for the second match is at 0xF095. Each password is four bytes long, but only the final three bytes are used. This is a remnant from the Japanese version, in which passwords were four characters long.

Music: The twelve bytes beginning at 0x1E9D1 specify the music played during each match of Tournament Mode. These depend only on the match number, not on what team you are playing as or against. The byte at 0x1EA0E specifies the music played during a match in VS Match Mode.

Match Order: The order in which you play teams in Tournament Mode is stored beginning at 0x1E9E9. As before, 0x00 indicates U.S.A., 0x01 indicates Holland, and so on. Note that the order is slightly different if you play as W. Germany or Argentina. In the former case, the order is stored beginning at 0x1E9F5; in the latter, it is stored beginning at 0x1EA01. Each of these sequences is twelve bytes long, since you play twelve matches in Tournament Mode.

RAM Addresses

Input: \$0000, \$0001, \$0006, and \$0007 store the status of controllers 1–4, respectively. The values of \$0006 and \$0007 are also mirrored at \$0002 and \$0003, respectively. From H.O. to L.O., the bits at these addresses store the status of the A, B, Select, Start, Up, Down, Left, and Right buttons. For example, the value of \$0001 is 0x41 if B and Right are pressed on controller 2. The values of \$0000–\$0003 are also mirrored at \$00D6–\$00D9 and \$00DA–\$00DD.

Graphics: \$0662 and \$0663 store offsets into the range \$0558–\$0657 specifying what graphical updates need to take place. No updates take place if the values at \$0662 and \$0663 are equal. Otherwise, the value at \$0662 is used as the beginning offset for the updates and the one at \$0663 as the ending. The actual data for the updates is stored within the range \$0558–\$0657.

Tournament Mode: \$002C–\$0030 temporarily store the digits of the password entered. \$0512 stores the value one less than the current match number. For example, the value of \$0512 is 0x03 when playing the fourth match.

In-Match: The descriptions of the following RAM addresses apply during a match.

\$018B: The six bytes beginning at this address store the health of the players on the Player 1 team. The order is lower forward, upper forward, center, lower defender, upper defender, and goalkeeper.

\$0191: Same as \$018B, but for the other team.

\$032C: Indicates which player has possession of the ball. Values of 0x00–0x05 correspond to the players on the Player 1 team, in the same order as for \$018B, while values of 0x06–0x0C correspond to the players on the other team (again, in the same order). Other values are also possible.

\$0451: The six bytes beginning at this address indicate which tiles are used for the upper heads of the players on the Player 1 team, in the same order as before. Values of 0x01–0x0F correspond to the fifteen faces starting at tile \$C0 in the sprite pattern table, while a value of 0x00 corresponds to the face at tile \$00.

\$0457: Same as \$0451, but for the other team.

\$0513: Stores the field on which the match is taking place. Values of 0x00–0x05 correspond to the Grassy, Soil, Concrete, Sand, Ice, and Bumpy fields, respectively.

\$0514: Stores the Player 1 team. Values of 0x00–0x0C correspond to the thirteen teams in the order listed in Tables 1–4.

\$0515: Same as \$0514, but for the other team.

\$0517: Stores the current score of the Player 1 team.

\$0518: Same as \$0517, but for the other team. 5.0pt plus 2.5pt minus 1.0pt 0.0pt

\$051A: Stores the number of seconds left in the current minute.

\$051B: Stores the number of minutes left until halftime or the end of the match.

\$0719: The four bytes beginning at this address store the number of super kicks taken by Players 1–4, respectively.

\$0720: The four bytes beginning at this address store the number of steps taken by Players 1–4, respectively.

Credits:

Many thanks to the following people:

- Technos for making one of the best football/soccer games ever.
- Mike Fredericks a.k.a. Gokuma for writing an excellent FAQ about the game that was very helpful for finding some of the offsets presented in the tables above.

History:

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