Changes in the GAP Character Table Library

This list contains the changes in the GAP character table library since the official upgrade for GAP 3.4 in October 1996. We denote mathematical errors by ******* and new information by **NEW**. We use **C** to denote changes that are not obviously corrections; the number of these changes is kept small.

Release of GAP 4.1 in July 1999

Brauer Tables

Changes are assigned to the simple group involved, and shown in alphabetical order.

*******	${}^2E_6(2)$	: The faithful characters of $2.{}^2E_6(2)$ and $2.{}^2E_6(2).2$ mod 19 were corrected (contributed by Jürgen Müller).
NEW	A_{13}	: Indicators of A_{13} and S_{13} mod 2 are now known.
NEW	A_{14}	: The tables of A_{14} mod 2, 11, 13 and tables of S_{14} mod 3, 5, 7 are now known.
NEW	A_{15}	: All Brauer tables of S_{15} are now known (contributed by Jürgen Müller).
NEW	A_{16}	: All Brauer tables of S_{16} are now known (contributed by Jürgen Müller).
NEW	A_{17}	: All Brauer tables except the 3-modular one of S_{17} are now known (contributed by Jürgen Müller).
NEW	Co_2	: The degree 156 538 character of Co_2 mod 2 is now proved.
NEW	Co_3	: One more indicator of Co_3 mod 2 is now known.
*******	Fi_{22}	: The faithful characters of $6.Fi_{22}$ and $6.Fi_{22}.2$ mod 5 were corrected.
*******	$L_3(4)$	: The faithful characters of $12_2.L_3(4)$ mod 7 were corrected.
NEW	$O_8^+(3)$	: The degree 50 596 characters of $O_8^+(3)$ mod 2 are now proved. Consequently, also the degree 101 192 of $O_8^+(3).2_1$ mod 2, the degrees 50 596 and 101 192 of $O_8^+(3).2_2$ mod 2, the degrees 50 596 and 151 288 of $O_8^+(3).3$ mod 2, and the degree 202 384 of $O_8^+(3).4$ mod 2 are now proved.
C	ON	: The tables of ON and $ON.2$ mod 19 were changed in order to respect the choice of classes in Robert Wilson's "Atlas of Group Representations".
NEW	ON	: The tables of ON mod 11 and mod 31 are now known (contributed by Markus Ottensmann), as well as two new indicator values for ON mod 2.
C	Ru	: The tables of Ru and $2.Ru$ mod 5 and mod 7 were changed in order to respect the choice of classes in Robert Wilson's "Atlas of Group Representations".
NEW	Ru	: The tables of Ru and $2.Ru$ mod 13 and 29 are now known (contributed by Frank Röhr), as well as all indicator values of Ru mod 2.
*******	$S_6(3)$	: The characters of $S_6(3)$ and $2.S_6(3)$ mod 7 were corrected; these changes do not affect the tables of $S_6(3).2$ and $2.S_6(3).2$ mod 7 (contributed by Jürgen Müller).
*******	Suz	: The faithful characters of $6.Suz$ and $6.Suz.2$ mod 7 were corrected (contributed by Jürgen Müller).
NEW	Th	: The table of Th mod 19 is now known.

Ordinary Tables

The following changes affect several ordinary tables.

C Whitespace at the end of `InfoText` strings was removed.

NEW Various class fusions were added.

NEW Components `tomidentifier` and `tomfusion` were added in order to provide a (preliminary) interface to the library of tables of marks.

C In the library tables of alternating and symmetric groups, the `classtext` components (partitions parametrizing the conjugacy classes; in some cases, this had been hidden inside the `CAS` component of the table) were replaced by values of the attribute `ClassParameters`.

NEW The tables of $L_2(q)$ were added for those values of q for which the table of marks of $L_2(q)$ is now contained in the GAP library.

NEW In the library tables of symmetric groups, the partitions parametrizing the irreducible characters are stored on the tables, as value of the attribute `CharacterParameters`.

C The `Identifier` values of a few tables have been changed. For example, the table of `L4(3).2^2` was previously known only as `psl(4,3).v4`. The old names are still valid.

******* The character tables with identifiers `iu332`, `D2MJ4`, and `P4L82` were removed. The former two tables were incomplete, the latter one was wrong.

NEW The ordinary tables of all maximal subgroups (and their class fusions) are now available for the groups $G_2(3)$, $J_3.2$, $2.M_{12}$, $M_{12}.2$, $M_{22}.2$, and $O_8^+(3)$.

The following changes are assigned to specific simple groups, and shown in alphabetical order.

******* A_6 : The table automorphisms of $4.A_6.2_3$ were corrected.

NEW Fi_{22} : The table of the maximal subgroup $2^7 : S_6(2)$ of $Fi_{22}.2$ was added (contributed by E. Mpono).

NEW Fi_{22} : The table of the maximal subgroup $2^6 : U_4(2).2$ of the maximal subgroup $2^6 : S_6(2)$ of Fi_{22} was added (contributed by E. Mpono).

NEW HS : The tables (and fusions) of several normalizers of chains of p-subgroups were added.

C J_4 : The classes and the characters of the maximal subgroup of type $2^{10} : L_5(2)$ were reordered, and the identifier was changed from `l52m10` (from the CAS library) to `2^10:L5(2)`.

NEW McL : The table of the seventh maximal subgroup of $McL.2$ was added.

C $O_8^+(2)$: The classes and the characters of the maximal subgroup of type $2^6 : A_8$ were reordered, and the identifier was changed from `mo81p` (from the CAS library) to `2^6:A8`.

C $O_8^+(3)$: The fusions from $O_7(3)$ and $3^6 : L_4(3)$ were changed to the ones listed in the Atlas of Finite Groups.

NEW $O_{10}^+(2)$: The table of the maximal subgroup $2^8 : O_8^+(2)$ was added.

NEW $S_{10}(2)$: The table of the subgroup $2^8 : S_8(2)$ was added.

NEW $U_4(3)$: The tables of $2.U_4(3).(2^2)_{122}$ and $6_2.U_4(3).2'_3$ were added.

Release of GAP 4.2 in March 2000

Brauer Tables

Changes are assigned to the simple group involved, and shown in alphabetical order.

NEW A_{14} : Table of S_{14} mod 2 is now known (contributed by Dave Benson, added by Jürgen Müller).

******* A_{16} : Corrected principal block of the table of S_{16} mod 2.

NEW ON : The tables of $3.ON$ mod 11 and 31 are now known.

C ON : The tables of $3.ON$ and $3.ON.2$ mod 19 were changed in order to respect the choice of classes in Robert Wilson's "Atlas of Group Representations". (This affects only the irreducibles of $3.ON$ of degrees 45090 and 77670.)

Ordinary Tables

The following changes affect several ordinary tables.

NEW Various class fusions were added.

C The `galomorphisms` components which had been contained in only a few tables were removed.

******* The `tomfusion` values of $L_2(25)$ and $2^5 : S_6$ were corrected.

******* Element orders and power maps in the table with identifier `s61p` were corrected.

******* The table with identifier `2.cenc1` was removed because it was inconsistent.

C Two instances of the table of $(A_6 \times A_6) : 2^2$ were unified.

C The tables with identifiers `J2.2M4`, `2^(2+4):(3x3):2^2`, and `2^(2+4):(S3xS3)` were unified; the identifiers `J2.2M5` and `2^(2+4):(S3xS3)` can be used to access the table.

NEW The ordinary tables of all maximal subgroups (and their class fusions) are now available for the groups S_6, $J_2.2$, $McL.2$, $Suz.2$, $3.Suz$, $3.Suz.2$, $Sz(32)$.

The following changes are assigned to specific simple groups, and shown in alphabetical order.

NEW A_6 : The table of $12.A_6.2_3$ is now available.

*** Fi_{22} : The name of the table of the 7-th maximal subgroup of Fi_{22} was corrected from `(2x2^(1+8):U4(2)):2` to `(2x2^(1+8)):U4(2):2`; similarly, `(2x2^(1+8):U4(2):2):2` was corrected to `(2x2^(1+8)):(U4(2):2x2)`.

NEW Fi_{22} : The tables of the maximal subgroups $2^{10} : M_{22} : 2$ of $Fi_{22}.2$ and $2^{11}.M_{22}$ of $2.Fi_{22}$ are now available via the names `Fi22.2M4` and `2.Fi22M5`, respectively.

C $U_3(5)$: The table with identifier `U3(5).S3` was removed; it is replaced by the table with identifier `U3(5).3.2` whose cosets of the outer automorphism group are ordered as in the Atlas of Finite Groups. The identifier `U3(5).S3` is now admissible for the table with identifier `U3(5).3.2`.

*** $U_4(3)$: The table with identifier `u4q3c` was removed; characters and power maps of this table were erroneous. Apparently the table was thought to be that of $3_2.U_4(3).2'_3$, which can be accessed with the name `3_2.U4(3).2_3'`.

NEW $U_4(3)$: The tables of $3_2.U_4(3).(2^2)_{133}$ and $U_4(3).(2^2)_{133}$ are now available.

Release of CTblLib 1.0 in January 2002

Brauer Tables

Changes are assigned to the simple group involved, and shown in alphabetical order.

NEW A_{14} : The tables of A_{14} mod $3, 5, 7$ and of S_{14} mod $11, 13$ are now known (contributed by Jürgen Müller, using MOC and the GAP package `specht`).

NEW A_{17} : The table of A_{17} mod 3 is now known (contributed by Jürgen Müller).

NEW F_{3+} : All Brauer tables of the maximal subgroup $3^7.O_7(3)$, and the 2-modular table of the maximal subgroup $(3 \times O_8^+(3){:}\,3){:}\,2$ are available (contributed by Gerhard Hiß).

NEW $L_4(4)$: The tables of $L_4(4)$ mod $3, 5, 7, 17$ are now known (contributed by Gerhard Hiß).

NEW Ly : The tables of Ly mod 37 and 67 are now known (contributed by Jürgen Müller, Max Neunhöffer, Frank Röhr, Robert Wilson).

NEW $O_8^+(3)$: The table of $O_8^+(3).S_3$ mod 2 is available.

NEW The table of $O_8^+(3).S_3$ mod 2 is available.

NEW $S_{10}(2)$: The tables of $S_{10}(2)$ mod $7, 11, 17, 31$ are now known (contributed by Gerhard Hiß).

Ordinary Tables

The following changes affect several ordinary tables.

NEW The ordinary tables of the Schur covers of the symmetric groups S_{14}, S_{15}, S_{16}, S_{17}, and S_{18} are now available (contributed by Gunter Malle).

NEW The ordinary tables of all maximal subgroups (and their class fusions) are now available for the group $2.HS$ (contributed by Ulrike Muthmann, Markus Ottensmann, and Frank Röhr).

NEW The ordinary tables of all maximal subgroups (and their class fusions) are now available for the groups $2.Suz$ and $6.Suz$ (contributed by Thomas Breuer and Frank Himstedt).

NEW The ordinary tables of all maximal subgroups (and their class fusions) are now available for the group $S_6(3)$.

The following changes are assigned to specific simple groups, and shown in alphabetical order.

NEW $E_6(2)$: The table of the Chevalley group $E_6(2)$ is now available (contributed by B. Fischer).

NEW F_{3+} : The table of the maximal subgroup $2^{1+12}.3_1.U_4(3).2_2'$ of F_{3+} is now available via the names `2^(1+12).3_1.U4(3).2_2'`, `F3+M9`, and `F3+C2B`.
The table of the maximal subgroup $3^3.[3^{10}].GL3(3)$ of F_{3+} is now available via the name `3^3.[3^10].GL3(3)`.

NEW $F_{3+}.2$: The table of the maximal subgroup $3^7.O_7(3):2$ of $F_{3+}.2$ is now available (contributed by Faryad Ali).

******* HS : The earlier (since CAS times) stored fusion of $2 \times A_6.2^2$ into HS did not lift to $2.HS$ and therefore was replaced by a compatible map.

NEW $L_3(4)$: The table of $2^2.L_3(4).2_2$ is now available.

NEW $L_4(9)$: The table of $L_4(9)$ is now available.

NEW M : The table of the maximal subgroup $2^{1+24}.Co_1$ is now available (contributed by Simon Norton).

NEW $S_4(7)$: The tables of $S_4(7)$ and $S_4(7).2$ are now available.

NEW $S_6(2)$: The table of the maximal subgroup $2^6{:}S_8$ of $2^6{:}S_6(2)$ (which is maximal in Fi_{22}) is now available (contributed by Faryad Ali).

NEW $S_6(5)$: The table of $S_6(4)$ is now available.

NEW $S_6(5)$: The table of $S_6(5)$ is now available.

NEW $S_{12}(2)$: The table of $S_{12}(2)$ is now available (contributed by Christoph Köhler).

******* Suz : The earlier (since CAS times) stored fusion of $(3^2{:}4 \times A_6).2$ into Suz did not lift to $3.Suz$ and therefore was replaced by a compatible map.

NEW $U_4(3)$: The table of $3_1.U_4(3).2_2'$ was added.

NEW $U_4(4)$: The table of $U_4(4)$ is now available.

NEW $U_6(2)$: The table of the Schur cover $(2^2 \times 3).U_6(2)$ is now available.

Release of CTblLib 1.1 in February 2004

Brauer Tables

The following changes affect several Brauer tables.

NEW The p-modular tables of $G.S_3$ are available for all prime divisors p of $|G|$, for G one of $L_3(7)$, $3.L_3(7)$, $U_3(5)$, $3.U_3(5)$, $U_3(8)$, $3.U_3(8)$, $U_3(11)$, and $3.U_3(11)$.

The following changes are assigned to the simple group involved, and shown in alphabetical order.

NEW Co_2 : The indicators of the 36938 and 83948 in Co_2 mod 2 are + (contributed by Jon Thackray).

NEW Co_3 : The indicator of the 88000 in Co_3 mod 2 is + (contributed by Jon Thackray).

NEW J_4 : The tables of J_4M1 mod 3 and 11 are available (contributed by Christoph Jansen).

NEW $O_8^+(3)$: The tables of $O_8^+(3).S_4$ mod 2, 5, and 7 are available (contributed by Christoph Jansen).

NEW ON : The tables of $ON.2$ and $3.ON.2$ mod 11 and 31 are available (contributed by Jürgen Müller).

NEW ON : The indicator of the 25916 in ON mod 2 is + (contributed by Jon Thackray).

NEW Suz : The indicators of 10504 in Suz mod 2 and $Suz.2$ mod 2 are + (contributed by Jon Thackray).

Ordinary Tables

The following changes affect several ordinary tables.

******* The table automorphisms were corrected for the tables with the identifiers `A17`, `2.A4xS3`, `4.M22M6`, `3.2^(2+4):(3x3):2`, `3^(1+6):2^(3+4):3^2:2`, `5:4x2.A5`, `D8xV4`, `3.3^5.U4(2)`, `3^5.U4(2)`, `group3`, `s61p`, `2.(A4xA4)`, `3^3:A4`, `3^7.O7(3)`, `ThN2`, and `2^2.2E6(2).2`; one reason for these errors were missing power maps.

C The formerly admissible names `c1`, `c2`, `c3` for the groups Co_1, Co_2, Co_3 have been removed, because these names are now admissible names of cyclic groups. The names `c1m1`, `c1m4`, `c1m5`, `c1m24`, `c1n3`, `c2m1`, `c2m2`, `c2m3`, `c2m4`, `c2m5`, `c2m6`, `c2m7`, `c2m8`, `c2m9`, `c2m10`, `c2m11`, `c2m22`, (now called `M22C2A`), `c2m24` (now called `M24C2B`), `c3m1`, `c3m2`, `c3m3`, `c3m4`, `c3m5`, `c3m6`, `c3m7`, `c3m8`, `c3m9`, `c3m10`, `c3m11`, `c3m12`, `c3m13`, `c3m14`, `c3n2`, `c3n3`, `c3n5`, `mcn2`, `mcn3`, `mcn5`, `om83`, `o8m2`, `o8m2.2`, `o10m2`, `o10m2c`, `o12m2`, `rvn2`, `s2m11`, `s2m12`, `s2m21`, `s2m23`, and `s2m24` (now called `M24C2A`) were removed because they would refer to maximal subgroups of other groups or of groups with nonadmissible names. The names `u4q3.s3` and `f22u3` were removed, the table is now available with the name `S3xU4(3)`.

C The ordering of maximal subgroups was changed for $A_5.2$, $A_6.2_1$, $J_3.2$, $M_{12}.2$, and $McL.2$, in order to be compatible with the ATLAS of Group Representations.

*** The following class fusions were corrected. $2^7:S_6(2)$ onto $S_6(2)$ and into $Fi_{22}.2$; $3.3^{1+4}:4S_5$ into $3.McL.2$; $D_8 \times V_4$ into HS; $3.2^{2+4}:(3 \times 3):2$ into $3.McL$, $3.2^4:A_7$, and $3.McLM10$; $4.M_{22}M6$ into $4.M_{22}$; $G_2(3)M6$ into $G_2(3)$; $A_5.2$ into $M_{12}.2$; $A_{11}Syl2$ into A_{11}.

NEW Missing power maps were added for the tables `suzs2`, `Fi22N3`, `RuN2`, `SuzN2`, `ThN2`, for $L_2(q)$, for various values of q, and for `7:3`, `23:11`, `11:10`, due to the availability of power maps in the underlying generic character tables.

NEW The tables of all maximal subgroups are available for A_5, A_6, A_7, $A_7.2$, $G_2(4)$, $L_2(11)$, $L_2(11).2$, $U_3(3).2$, $U_5(2)$.

NEW Several ordinary tables were added for which the tables of marks of the underlying groups are available in the GAP Library of Tables of Marks; this includes direct products and tables of small groups that can be computed easily with standard methods. The other way round, each ordinary table in the library for which the table of marks is contained in the GAP Library of Tables of Marks stores a class fusion into the table of marks.

NEW Several ordinary tables of Sylow normalizers in sporadic simple groups are available, including the normalizers of cyclic Sylow subgroups.

NEW The ordinary tables of $G.S_3$ are available for G one of $2^2.L_3(4)$, $L_3(7)$, $3.L_3(7)$, $2^2.O_8^+(2)$, $3.U_3(5)$, $U_3(8)$, $3.U_3(8)$, $U_3(11)$, $3.U_3(11)$.

NEW The ordinary tables of $L_4(5)$, $O_7(5)$, $O_7(5).2$, $O_9(3)$, $S_4(8)$, $S_8(3)$, $U_4(5)$ are available.

NEW Generic character tables are available for the double covers of alternating and symmetric groups (contributed by Felix Noeske).

The following changes are assigned to specific simple groups, and shown in alphabetical order.

C A_6 : The fusions of A_6, $A_6.2_1$, $2.A_6$ into the tables of marks were changed in order to make diagrams of fusions commutative.

NEW B : The tables of the maximal subgroups of the types $3^{1+8}.2^{1+6}.U_4(2).2$ and $(2^2 \times F_4(2)):2$, and the table of the Sylow 7 normalizer are available, as well as the table of the maximal subgroup of the type $(S_3 \times 2.Fi_{22}).2$ in $2.B$.

NEW Co_1 : The table of the Sylow 5 normalizer is available.

NEW Co_2 : The table of the Sylow 2, 3, and 7 normalizers are available.

NEW Fi'_{24} : The tables of the maximal subgroups $3^2.3^4.3^8.(A_5 \times 2A_4).2$, $2^{3+12}.(L_3(2) \times A_6)$, and $2^{6+8}.(S_3 \times A_8)$ and their class fusions are now available (contributed by Alexander Hulpke).

NEW The tables of the Sylow 5 and 7 normalizer are available.

NEW HN : The table of the maximal subgroup $4.HS.2$ of $HN.2$ is available.

C HS : The class fusion of HS into Co_3 was replaced by one that is compatible with the Brauer tables available.

C J_2 : The class fusion of $2.J_2.2$ into $2.Suz$ was replaced by one that is compatible with the Brauer tables available.

*** The class fusion of $2.HS.2$ into HN was corrected.

*** J_4 : The table with identifier `(3^(1+2)x2).SD16` is **not** that of the Sylow 3 normalizer in J_4; the name `J4N3` is no longer admissible for this table (reported by G. Navarro and A. Moreto).

NEW The table of the Sylow 3 normalizer in J_4 is available, via the names `(2x3^(1+2)_+:8):2` and `J4N3`.

C $L_2(11)$: The class fusion of $L_2(11)$ into J_1 was replaced by one that is compatible with the Brauer tables available.

C $L_2(16)$: The class fusions of $L_2(16).2$ into J_3 and of $L_2(16).4$ into $J_3.2$ were replaced by maps that are compatible with the Brauer tables available.

C $L_2(19)$: The class fusion of $L_2(19)$ into J_3 was replaced by one that is compatible with the Brauer tables available.

C $L_2(27)$: The class fusion of $L_2(27).3$ into $S_6(3)$ was replaced by one that is compatible with the Brauer tables available.

C $L_3(3)$: The class fusions of $L_3(3).2$ into $G_2(3)$ and $S_6(3)$ were replaced by maps that are compatible with the Brauer tables available.

C $L_3(4)$: The class fusions of $4_2.L_3(4).2_1$ into ON and of $4_2.L_3(4).2_3$ into $4.U_4(3).2_3$ were replaced by maps that are compatible with the Brauer tables available.

NEW The tables of $2^2.L_3(4).2_3$ and $2^2.L_3(4).3$ are available.

NEW $L_3(11)$: The table of $L_3(11)$ is available (contributed by Frank Lübeck, computed with a program written by Boris Hemkemeier and Ulf Jürgens).

C $L_4(3)$: The class fusion of $L_4(3).2_2$ into $O_7(3)$ was replaced by one that is compatible with the Brauer tables available.

NEW $L_8(2)$: The table of $L_8(2)$ is available (contributed by Frank Lübeck, computed with a program written by Boris Hemkemeier and Ulf Jürgens).

NEW M : The tables of the Sylow 11 and 13 normalizer in M are available, via the names `MN11` and `MN13`.

NEW The tables with the names `4.2^2`, `(2^2x3).2`, `1/2(8xS3)`, `M12C4`, `7^1+2.6`, `2x3.A6`, `5^1+2.2A4`, `(4xA6).2^2`, `13^1+2.2A4`, `7^1+4.2A7` are available (contributed by Simon Norton).

C M_{23} : The class fusion of M_{23} into Co_3 was replaced by one that is compatible with the Brauer tables available.

C M_{24} : The class fusion of $2^4:A_8$ into M_{24} was replaced by one that is compatible with the Brauer tables available.

C McL : The class fusion of $McL.2$ into Co_3 was replaced by one that is compatible with the Brauer tables available.

*** The 2nd power map of the table of the maximal subgroup of type $3.3^{1+4}:4S_5$ of $3.McL.2$ was corrected.

C $O_8^-(2)$: The class fusion of $O_8^-(2).2$ into $S_8(2)$ was replaced by one that is compatible with the Brauer tables available.

NEW $O_8^+(2)$: The tables of $2^2.O_8^+(2).2$ and $2^2.O_8^+(2).3$ are available, as well as the table of the maximal subgroup of the type $2_+^{1+6}.A_8$ of $2.O_8^+(2)$.

NEW $O_8^+(3)$: The table of $O_8^+(3).D_8$ is available.

NEW The tables of the maximal subgroup $2^2.(U_3(3).2 \times S_4)$ of $O_8^+(3).S_4$ and of the maximal subgroups $3^{3+6}:(L_3(3) \times D_8)$ and $3^6.L_4(3).D_8$ of $O_8^+(3).D_8$ are available.

NEW $O_8^-(3)$: The table of $O_8^-(3).2_1$ is available.

NeW $O_9(3)$: The table of the maximal subgroup of type $2^8.A_9$ is available.

C $S_4(4)$: The class fusion of $S_4(4).2$ into $S_8(2)$ was replaced by one that is compatible with the Brauer tables available.

C $S_6(3)$: The class fusion of $3^6:L_3(3)$ into $S_6(3)$ was replaced by one that is compatible with the Brauer tables available.

C $U_3(5)$: The class fusion of $3.U_3(5)$ into $3.McL$ was replaced by one that is compatible with the Brauer tables available.

NEW $U_4(3)$: The table of $2^2.U4(3).(2^2)_{122}$ is available.

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