SGF FF[4] - Smart Game Format *last updated: 1999-12-12*

SGF User Guide

Version: 1.2

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1. What is SGF?

SGF is short for **Smart Game Format**.

SGF is a file format used to store game records of two player board games. It is a text-only tree based format, i.e. it doesn't contain binary data and thus can easily be emailed or posted to newsgroups. Tree based means, that starting from a root one can follow a main path or switch to variations (or variations of variations).

SGF provides many features such as board markup, comments, game information, setup positions etc. In order to create a good SGF file one should have some knowledge of the internal structure of SGF.

Versions

SGF was invented by Anders Kierulf in 1987 and became more and more popular. Since then SGF has undergone 2 major revisions.

- **FF[1]** is the original specification by Anders Kierulf. This specification is the core of all later versions. Some applications still use this dated version of SGF - e.g. MGT (MS-DOS version) which had become quite popular before Windows became en vogue.
- **FF[3]** was written by Martin Müller in 1993 and was a first step towards a clean specification of the SGF standard. By then SGF was an accepted standard for Go games on the Internet. FF[3] defined a lot of new properties, e.g. many game information properties and some markup properties.
- **FF[4]** was written by Arno Hollosi in 1997 with help from many SGF applications programmers. FF[4] carried on the spirit of FF[3] and provides a clean, unambiguous definition of SGF. New features such as arrows, lines, boards of any size and rectangular boards have been introduced. However as this standard is very young, it isn't widely adopted. This will (hopefully) change in the future.

What does an SGF file look like?

Here's a short example:

```
(;FF[4]GM[1]SZ[19]AP[SGFC:1.13b]

PB[troy]BR[12k*]
PW[john]WR[11k*]
KM[0.5]RE[W+12.5]
DT[1998-06-15]
TM[600]

;B[pd];W[dp];B[pq];W[dd];B[qk];W[jd];B[fq];W[dj];B[jp];W[jj]
;B[cn]LB[dn:A][po:B]C[dada: other ideas are 'A' (d6) or 'B' (q5)]
;W[eo](;B[dl]C[dada: hm - looks troublesome.
Usually B plays the 3,3 invasion - see variation];W[qo];B[qp]
...
;W[sr];B[sk];W[sg];B[pa];W[gc];B[pi];W[ph];B[de];W[ed];B[kn]
;W[dh];B[eh];W[se];B[sd];W[af];B[ie];W[id];B[hf];W[hd];B[if]
;W[fp];B[gq];W[qj];B[sj];W[rh];B[sn];W[so];B[sm];W[ep];B[mn])
...
(;W[dq]N[wrong direction];B[qo];W[qp]))
```

SGF applications

SGF applications are available for all platforms. Most of them are freeware, some are shareware. Have a look at the Go FTP Archive.

As no program is perfect and SGF is evolving it's strongly recommended to update one's favorite SGF application at least once a year. Right now many people still use applications that are over five years old which causes a lot of trouble.

Update your application on a regular basis!

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2. General Concepts

SGF consists of nodes which are structured in a tree, i.e. a node has exactly one predecessor called

parent, but may have one *or more* successors called children. Thus SGF can store game records (a list of moves) and variations of the actual line of play.

A node is the smallest unit visible to the user, i.e. the user steps through the tree node-wise (forward [down the tree], backward [up the tree], etc.).

A node consists of properties. These properties contain a certain kind of information, e.g. the *B[]* property describes a black move made, the *C[]* property contains a comment text (don't worry: you don't have to remember the property names :-).

For example: if you step forward and see a new move on the board and a comment in the comment window plus some markup on the board then all this information is represented by **different** properties which are parts of the **same** node.

Thus editing is done in two levels: adding/deleting nodes and adding or deleting properties.
To make it clear: a move is part of a node and not the node part of the move. A move is represented by *one* property but a node may contain *more than one* property.

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3. `Make a Move' vs. `Place a Stone'

SGF provides two ways to add new stones to the board:

- make a move
- place a stone

Making a move is like making a move in a real game, i.e. you can only make moves on empty intersections, you can only make one move per turn (here: per node) and you may take some prisoners by making a move. In most applications the current move is highlighted.

Placing a stone on the board is like setting up a position, e.g. handicap stones, setting up a problem or analysis of positions ("this would work if the position over there would look like this..."). Thus one can place *more than one* stone, stones of different colors, remove stones, replace stones with that of the opposite color all in *one* node.
But: there are no prisoners made as these are not regular moves!

Restrictions

It is good style (and is required since FF[4]) to distinguish between a move and the position arrived at by this move.

Therefore it's **illegal** to mix setup properties and move properties within the same node.

Move properties are properties such as a black or white move, annotations on a move (bad move, interesting move, etc.) or how much time a player had left after the current move was made.
Setup properties are properties used to set up or describe a position such as place black/white stones on the board or who's turn it is to play.

A detailed list of setup and move properties is available.

Unfortunately many applications allow mixing setup and move properties, so it's up to the user to create a good SGF file.

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4. Style

- The **first** branch (variation `A' or `1') is the **main** branch.
  Variation `A' should always follow the real game. Consider yourself viewing a game where you have to press `b' then `c' and then `b' again just to follow the real game - disturbing.
- Don't imitate sibling-style variations. Use a sibling-style application instead. Have a look at definition and reason.
- Omit extra pass plays and empty nodes at the end of the game.
  The last node of the game should contain the last move on the board. Do not put game information such as `Black wins and connects Ko' into the comment field, rather add another move to the game which connects the Ko.
- Never substitute moves with placing stones.
  Never substitute a regular move with placing (setting up) a stone. Some applications rely on regular moves for sophisticated functions. Furthermore applications that show the position of the next move can't display the position of the setup stone. Have a look at the difference between a real move and setting up a stone.
- Length of labels
  Since FF[4] it's possible to use labels of any size. But some (old) applications have problems displaying labels longer than 2 chars. Use long labels with care!
- Don't store game information such as who's black/white etc. into the first comment - use game information properties instead. Here's the reason why.
- Use annotations for standard situations (e.g bad move).
  Annotations are represented by extra SGF-properties and thus can be treated in a special way.

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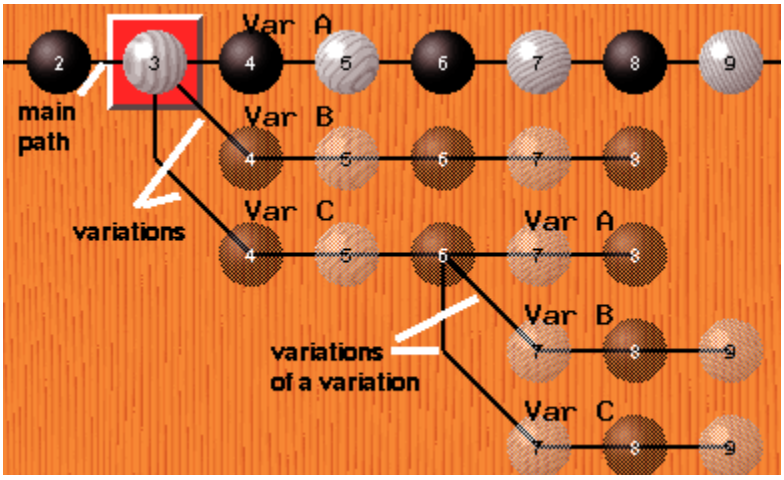
5. Variations

SGF allows you to store variations of the main path of play, which is useful for analyzing different lines of play. The picture to the right illustrates this concept. Variations are usually assigned letters starting with 'A' where 'A' is the continuation of the current line of play. That's why some applications refer to the next move as 'A'.



Applications show variations as either siblings or children. **Showing variations as children** means, that if the applications is currently at move #3 (like in the picture) it provides you the choice of 'A' through 'C' which are all

move #4. That is, by selecting a variation, you step forward in the tree.

Showing variations as siblings means, that the application provides the variation choice at move #4. In this case, selecting a variation selects between moves at the same tree level (here: #4 moves). This method is perceived as alternatives to the current move and by e.g. selecting variation 'B' move #4 'A' is removed from the board and move #4 'B' is shown.

The differences between this two styles may cause confusion when the variations are accompanied by comments. For example, imagine the comment saying something like: "This is bad. See variation 'B' instead." If the author used a children-style application this comment is stored together with move #3. If readers use a sibling-style application, they see the comment on move #3, but no variations: they appear with the next move. The other case (author: sibling style, reader: children style) has similar implications. Users who read the comment at move #4 have to go back one move and select the variation there.

Most people prefer the sibling style as it seems more natural. They even imitate the sibling style in children-style applications. This is done by removing the previous move and making a new move in the same (first) node of the variation. This is **bad style**. Since FF[4] it's illegal syntax too. If you have a look at the picture you see that all alternative moves are at the same level (that is, all #4's are in one column, all #7's are in one column). By imitating the sibling-style in chlidren-style applications this is no longer the case, as the #4 moves of variation 'B' and 'C' would appear under move #5 of variation 'A'. Furthermore those files cannot be converted to other fileformats easily. If you like sibling-style variations then use a sibling-style application!

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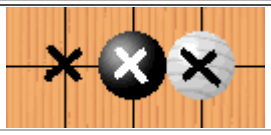
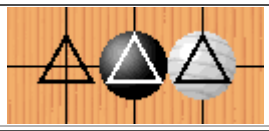
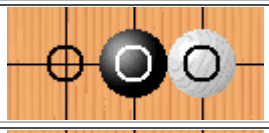
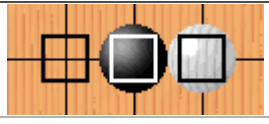
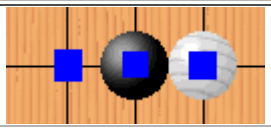
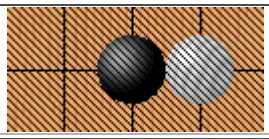
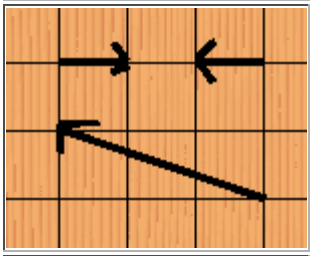
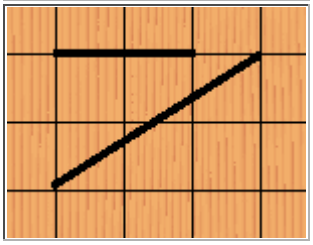
6. Board markup

SGF provides a wide selection of board markup. Almost every markup you see in magazines or books is available in SGF too. However some applications are not able to handle certain types of markup. Here's a short list of markup types available:
Snapshots taken from **cgoban** by W.M. Shubert

Markup	Property	Notes
	MA[]	Very common (introduced in FF[3])
	TR[]	Very common (introduced in FF[3])
simple markup	M[]	old (FF[1]), very common This markup has been superceeded by MA[] and TR[], however very old applications still use M[] and don't understand MA[] and TR[].
	CR[]	common (introduced in FF[3])
	SQ[]	common (introduced in FF[4])

	LB[]	common (introduced in FF[3]) Old applications can't display it (e.g. MS-DOS MGT) Note that long labels consisting of multiple chars are possible. However many applications only display the first 2 or 3 characters - use long labels with care.
letters	L[]	old (FF[1]), very common This markup has been superceeded by LB[], however very old applications (e.g. MS-DOS MGT) still use L[] and don't understand LB[]
	SL[]	old, uncommon
	DD[]	new (FF[4]), very uncommon (may become more common in the future)
	AR[]	new (FF[4]), very uncommon (may become more common in the future)
	LN[]	new (FF[4]), very uncommon (may become more common in the future)

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7. Comments and annotations

In order to comment on a move or position SGF allows to store text in each node, which usually gets displayed in the comment window of your SGF application. Text is easy to edit, but has some disadvantages too:

- language - if you don't understand the language you can't understand the comment
- applications can't use the text to provide more sophisticated functions (such as searching for bad moves or tesujis)
- computer players can't utilize the text information

Therefore SGF provides a set of so-called annotation properties. These properties are encoded differently in the file. They are not stored as readable text, but as tokens, which have a special meaning. Thus the SGF application reading the file knows their meaning and can provide the following:

- multi-lingual support - the application displays the message in the selected language.

- search or other database functions
- computer players can use annotations in their fuseki- or joseki-library to determine the best move or good alternatives.

There are three types of annotation properties: *general annotations*, *move annotations* and *annotations on positions*. Have a look at the following table:

Annotation	Property	Type	may be emphasized?	Meaning
Good for Black	GB	General	yes	Something good for black
Good for White	GW	General	yes	Something good for white
Even position	DM	General	yes	The position is even
Unclear position	UC	General	yes	The position is unclear
Hot spot	HO	General	yes	An important node (e.g. game deciding move)
Tesuji	TE	Move	yes	The move played is (locally) a good move
Bad move	BM	Move	yes	The move played is bad
Doubtful move	DO	Move	no	The move played is doubtful
Interesting move	IT	Move	no	The move played is interesting
Black to play	PL	Position	no	It's black turn to play
White to play	PL	Position	no	It's white turn to play

Unfortunately not many applications support these properties yet. This will hopefully change in the future. Consider using annotation properties whenever possible. They have many advantages despite their simplicity.

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8. Game Information

SGF provides a wide range of properties to store so called game information. Usually applications provide a dialog or extra window to type in game information.

Note that some entries have a **mandatory format**. Why?
Because standard compliant entries can easily be parsed by applications and therefore can be searched in game collections or displayed in your favorite (customized) scheme. Unfortunately many applications allow the user to enter illegal information - so it's up to you to create correct entries - please take care!

E.g. consider that you've got a game collection of about 5000 pro games and want to look for games played by Cho Chikun in March 1996. Now if dates are stored as e.g. DT[5th March 1996], DT[11/3/96], DT[1996/3/7], DT[1996 6 8] - do you really know which of these games were played in

March?

Why should you use game information?

Sometimes you see a SGF file which has all the information stored into the first comment.
This is bad style!
If the information is stored into a comment it's almost impossible for a computer program to find the relevant data - searching becomes impossible. Therefore store the game information at the proper place - it'll save you much time in the future and makes your database more usable. It makes converting or interchanging of games much more easier too.

List of game information properties

Here's a complete list with a short description of each item. If this list doesn't answer all your questions have a look at the official, detailed specification.
Note: recommended is not mandatory! But you should use the recommended format whenever possible.

Name	Property	Notes
Black/white name	PB[]/ PW[]	Name of the player who played black/white Try to be consistent in using names - for professional players it's suggested to use the same names as Jan van der Steen in his database.
Black/white rank	BR[]/ WR[]	Strength of the player who played black/white Recommended format: "10k" or "10 kyu" for a kyu player "3d" or "3 dan" for a dan player Go servers usually add a `*' (certain rating) or `?' (uncertain rating) e.g. "10k*"
Black/white team	BT[]/ WT[]	Name of the team (for games played in team events)
Result	RE[]	Final result of the game **Mandatory format:** "0" (zero) for a draw (jigo) "B+score" for a black win and "W+score" for a white win, e.g. "B+2.5", "W+64" or "B+0.5" "B+R"/"B+Resign" and "W+R"/"W+Resign" for a win by resignation. **You MUST NOT write "Black resigns"** A more detailed description is available.
Komi	KM[]	Score adjustment (points added to White's score) **Mandatory format:** Use real values, e.g. "5.5", "0", "0.5" or "-10," etc. Don't use: "5 points", "half a point", "5 1/2", etc.
Handicap	HA[]	Number of handicap stones **Mandatory format:** Use integer values greater zero, e.g. "1", "5" or "9" Don't use: "2 stones", "three"

Time	TM[]	Regular playing time for each side
		Mandatory format:
		`Time is given in seconds as a real value, e.g. "4600", "300"`
		`Don't use: "1 hour"`
		It's a little bit awkward if your application doesn't transform the real value into a somewhat more human-readable form. But please use real values!

Date	DT[]	Date when game was played
		Mandatory format:
		`Use the ISO-standard format "YYYY-MM-DD"`
		`Do not use other separators such as "/" or " " or ".".`
		`Example: a game played on the 5th March 1997`
		`would be encoded as: 1997-03-05`
		A more detailed description is available.

Event	EV[]	Name of event (e.g. tournament name)
Round	RO[]	Number of tournament round
Place	PC[]	Name of place (e.g. city, country) where game took place
Rules	RU[]	Name of rule set used (e.g. Japanese, Chinese, AGA, GOE, etc.)
Game name	GN[]	Name of the game
Opening	ON[]	Describes the opening played (e.g. san-ren-sei)
Game comment	GC[]	General comment about the game
Source	SO[]	Name of the source (e.g. book, journal, etc.)
User	US[]	Name of user (or program) who entered the game record
Annotation	AN[]	Name of the person who made the annotations
Copyright	CP[]	Any copyright information

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