

LABEL 00000000LINE 00177112CC EX D/R;COMMON=1;FILE S=ADOLAR/APTLIB;END+

0 /R

FILE: ADOLAR/APTLIB FRIDAY 04/22/77 12:05 PM

ALGOL DOLLAR CARDS 00001000
ALGOL COMPILER CONTROL CARDS 00001600

00001700

00001800

VARIOUS OPTIONS ARE AVAILABLE DURING COMPILATION AND MAY BE ACTIVATED OR00001900
DEACTIVATED BY <COMPILER CONTROL CARD>S. THESE CARDS ARE USED TO00002000
CONTROL THE HANDLING OF SOURCE LANGUAGE INPUT BY THE COMPILER AND MAY BE00002100
INTERSPERSED ANYWHERE WITHIN THE SOURCE LANGUAGE INPUT. 00002200

SYNTAX:

<COMPILER CONTROL CARD> ::= <OPTION CONTROL CARD>
<VOID CARD> 00002300

<OPTION GROUP LIST> ::= <EMPTY> / <OPTION GROUP LIST>
<OPTION GROUP> 00002400

<OPTION GROUP> ::= <OPTION ACTION> <OPTION LIST> /
<PARAMETER> / <EXPLICIT SET> 00002500

<OPTION ACTION> ::= SET / RESET / POP 00002600

<OPTION LIST> ::= <EMPTY> / <OPTION LIST> <OPTION> 00002700

<OPTION> ::= CARD / CHECK / <LIST OPTIONS> / LISTP / NEW /
NEW TAPE / OMIT / \$ / PRT / PUNCH / SEGS / 00002800
SEQ / SEQERR / SEQREQ / SINGLE / TAPE / VOID / 00002900
VOIDT / <IDENTIFIER> 00003000

<LIST OPTIONS> ::= DEBUGN / LISTA / LIST 00003100

<PARAMETER> ::= <ERROR LIMIT> / PAGE / <SEQUENCE INCREMENT> /
<SEQUENCE BASE> / INFO 00003200

<ERROR LIMIT> ::= LIMIT <UNSIGNED INTEGER> 00003300

<SEQUENCE INCREMENT> ::= + <UNSIGNED INTEGER> 00003400

<SEQUENCE BASE> ::= <UNSIGNED INTEGER> 00003500

<EXPLICIT SET> ::= SET <OPTION> = <OPTION EXPRESSION> 00003600

<OPTION EXPRESSION> ::= <OPTION> / NOT <OPTION> 00003700

<VOID CARD> ::= \$VOID <VOID RANGE> / \$VOIDT <VOID RANGE> 00003800

<VOID RANGE> ::= <EMPTY> / <VOID STRING> / "<PROPER STRING>" 00003900

<VOID STRING> ::= [ANY CONTIGUOUS STRING OF CHARACTERS
EXCLUDING BLANKS AND QUOTES] 00004000

00004100

00004200

00004300

00004400

00004500

00004600

SEMANTICS:

THE ABSENCE OF ANY <COMPILER CONTROL CARD>S IN THE COMPILER INPUT
AUTOMATICALLY SETS THE OPTIONS "CARD" AND "LIST" BY DEFAULT (I.E.,
IF NO <COMPILER CONTROL CARD>S ARE INCLUDED IN THE COMPILER INPUT).
THE \$-CARD:

\$ CARD LIST

IS AUTOMATICALLY INCLUDED BY THE COMPILER.

COMPILER CONTROL CARD INFORMATION MUST APPEAR IN COLUMNS 1-71 OF
CARD-IMAGE. COLUMNS 72-80 ARE RESERVED FOR CONTROL INFORMATION AND
A SEQUENCE NUMBER.

THE \$-SIGN NORMALLY APPEARS IN COLUMN ONE. IF THE \$-SIGN APPEARS
ANYWHERE ELSE, THE INFORMATION FOLLOWING IT IS STILL RECOGNIZED AS
CONTROL INFORMATION; HOWEVER, THE CARD-IMAGE MAY BECOME PART OF THE
NEW SOURCE LANGUAGE FILE AND WILL APPEAR ON THE LINE PRINTER OUTPUT
LISTING, IF ONE IS REQUESTED. THUS, THE FILE "NEWTAPE" MAY CONTAIN
CONTROL CARDS WHICH HAVE THEIR FIRST DOLLAR SIGN NOT APPEARING IN
COLUMN ONE.

THE FUNCTION OF <OPTION ACTION>S ON <COMPILER CONTROL CARD>S IS TO
CHANGE THE CURRENT STATE OF VARIOUS COMPILER <OPTION>S. ASSOCIATED
WITH EACH <OPTION> THERE IS A 47-BIT STACK IN WHICH THE HISTORY OF
THE STATES OF THAT <OPTION> IS STORED. THE BIT AT THE TOP OF THE
STACK REPRESENTS THE CURRENT STATE OF THE <OPTION>.

AS WITH ANY OTHER PUSH-DOWN STACK MECHANISM, STORED INFORMATION IS
RETRIEVED ON A LAST-IN FIRST-OUT BASIS. AN <OPTION> WHOSE DEFAULT
VALUE IS "RESET" IS INITIALLY ASSIGNED A STACK FILLED WITH ZEROES.
AN <OPTION> WHOSE DEFAULT VALUE IS "SET" IS INITIALLY ASSIGNED
STACK WITH A ONE ON TOP AND ZEROES ELSEWHERE. "SET" CAUSES THE
<OPTION> STACKS CORRESPONDING TO THE <OPTION>S FOLLOWING IT TO BE
PUSHED-DOWN ONE BIT AND A ONE TO BE PUT ON TOP OF THESE STACKS.
"RESET" CAUSES THE <OPTION> STACKS CORRESPONDING TO THE <OPTION>
FOLLOWING IT TO BE PUSHED DOWN ONE BIT AND A ZERO TO BE PUT ON TOP
OF THESE STACKS. "POP" SIMPLY CAUSES THE <OPTION> STACKS
CORRESPONDING TO THE <OPTION>S FOLLOWING IT TO BE POPPED. THAT IS,
THE STACKS ARE PUSHED-UP ONE BIT.

AN <OPTION LIST> WITH NO <OPTION ACTION> CAUSES ALL <OPTION>S WHICH
APPEAR IN THE LIST TO BE SET, AND ALL <OPTION>S NOT IN THE LIST TO
BE RESET.

THE FOLLOWING IS A BRIEF DISCUSSION OF EACH <OPTION> AND
<PARAMETER>:

BEND

THE OPTION BEND(BEGIN-END PAIRS) IN CONJUNCTION WITH
LIST CAUSES THE SEQUENCE# OF THE "BEGIN" ASSOCIATED
WITH EACH "END" TO BE PRINTED ON THE LINE BELOW

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AND TO THE RIGHT OF THE LINE CONTAINING THE "END". 00012430
00012500
00012600
CARD THE SOURCE PROGRAM IS BEING ENTERED SOLELY FROM 00012700
THE CARD READER. 00012800
00012900
CHECK ALL INPUT CARD-IMAGES (WHETHER FROM CARD READER, 00013000
TAPE, OR CAST FILES) WILL BE CHECKED FOR PROPER 00013100
SEQUENCE ORDER. IF THE NEXT CARD-IMAGE TO BE 00013200
COMPILED HAS A LOWER SEQUENCE NUMBER THAN THE 00013300
PREVIOUSLY COMPILED CARD, A MESSAGE, "SEQUENCE 00013400
WARNING", IS PRINTED ABOVE AND TO THE RIGHT OF 00013500
THE CARD-IMAGE ON THE LINE PRINTER. IF NONE OF 00013600
THE "LIST" OPTIONS IS SET, THEN THE LINE PRINTER 00013700
FILE IS OPENED AND THE "SEQUENCE WARNING" MESSAGE 00013800
AND THE ASSOCIATED CARD-IMAGE ARE PRINTED. THE 00013900
MESSAGE "SEQUENCE WARNING" IS ONLY A WARNING AND 00014000
IS NOT CONSIDERED AN ERROR BY THE COMPILER. 00014100
00014200
DEBUGN THE OBJECT CODE PRODUCED BY THE COMPILER IS 00014300
LISTED FOLLOWING EACH SOURCE STATEMENT. "DEBUGN" 00014400
AUTOMATICALLY SETS "LIST" BY DEFAULT. 00014500
00014600
\$ THIS OPTION MUST APPEAR SOMEWHERE IN COLUMNS 3-71 00014700
INCLUSIVE AND BE PRECEDED BY A BLANK TO ELIMINATE 00014800
REDUNDANCY. ALL <COMPILER CONTROL CARD>S WHOSE 00014900
DOLLAR SIGNS APPEAR IN COLUMN ONE WILL BE LISTED 00015000
ON THE LINE PRINTER IF ONE OF THE <LIST OPTIONS> 00015100
IS SET. 00015200
00015300
<IDENTIFIER> IF A WORD ON AN <OPTION CONTROL CARD> IS NOT 00015400
RECOGNIZED AS ONE OF THE COMPILER-DEFINED 00015500
OPTIONS, THEN IT IS ASSUMED TO BE A USER-DEFINED 00015600
OPTION. IT MAY BE MANIPULATED EXACTLY AS ANY 00015700
OTHER OPTION. THAT IS, IT MAY BE SET, RESET, OR 00015800
POPPED. ITS PRIMARY USE IS TO EXPLICITLY SET AND 00015900
RESET THE COMPILER-DEFINED OPTIONS. ALL USER- 00016000
DEFINED OPTIONS MUST BE LESS THAN 64 CHARACTERS 00016100
IN LENGTH AND UNIQUE IN THEIR LENGTH AND/OR 00016200
UNIQUE IN THEIR FIRST FIVE CHARACTERS, SINCE THE 00016300
COMPILER SCANNER, UPON ENCOUNTERING A USER- 00016400
DEFINED OPTION, REMEMBERS ONLY THE OPTION'S 00016500
LENGTH AND FIRST FIVE CHARACTERS. 00016600
00016700
FORMAT QUADRUPLE SPACING WILL BE PERFORMED AFTER EACH 00016710
END OF A PROCEDURE. 00016720
00016730
INFO THE APPEARANCE OF THE WORD "INFO" CAUSES THE 00016800
ELBAT AND INFO TABLES OF THE COMPILER TO BE 00016900
DUMPED IMMEDIATELY ONTO THE LINE FILE. THIS IS 00017000
FOR COMPILER DEBUGGING ONLY, AND SHOULD NOT BE 00017100
USED OTHERWISE, SINCE VOLUMINOUS OUTPUT IS 00017200
PRODUCED. 00017300
00017400
LIMIT COMPILATION WILL BE TERMINATED IF THE NUMBER OF 00017500
00017700
00017800

		00017900
		00018000
	ERRORS DETECTED BY THE COMPILER EQUALS OR EXCEEDS	00018100
	THE <ERROR LIMIT>.	00018200
		00018300
LISTA	THIS <OPTION> CAUSES ALL INPUT TO BE LISTED	00018400
	INCLUDING ALL "OMITTED" CARD-IMAGES (SEE "OMIT"	00018500
	<OPTION>).	00018600
		00018700
LIST	THE SOURCE PROGRAM INPUT ACTUALLY COMPILED IS	00018800
	LISTED. IN ADDITION, THE <OPTION> "SEGS" IS ALSO	00018900
	SET BY DEFAULT. IF THE <LIST OPTIONS> ARE ALL	00019000
	RESET, THEN ONLY SYNTAX ERROR MESSAGES, SEQUENCE	00019100
	ERROR MESSAGES, AND THE ASSOCIATED CARD-IMAGES	00019200
	WILL BE LISTED ON THE PRINTER.	00019300
		00019400
LISTP	IF "LISTP" IS SET AND THE <LIST OPTIONS> ARE	00019500
	RESET, THEN ONLY THE CARD-IMAGES INPUTTED FROM	00019600
	THE CARD-READER WILL BE LISTED ON THE LINE	00019700
	PRINTER. IF ANY OF THE <LIST OPTIONS> IS SET,	00019800
	"LISTP" IS IGNORED.	00019900
		00020000
NEW	THIS <OPTION> CAUSES A NEW SOURCE FILE TO BE	00020100
	CREATED ON A TAPE FILE KNOWN AS "NEWTAPE" AND	00020200
	LABELLED "OCDIMG". ALL COMPILED CARD-IMAGES AND	00020300
	"OMITTED" (SEE "OMIT") CARD-IMAGES ARE INCLUDED	00020400
	IN THE NEW SOURCE LANGUAGE FILE. THE NEWTAPE	00020500
	FILE WILL BE BLOCKED (X,56,10). THE "NEWTAPE"	00020600
	FILE MAY BE LABEL-EQUATED TO DISK, IN WHICH CASE	00020700
	IT WILL BE BLOCKED (X,10,150).	00020800
		00020900
NEW TAPE	THIS <OPTION> IS IDENTICAL TO THE <OPTION> "NEW".	00021000
		00021100
OMIT	ALL CARD-IMAGES INPUTTED, WHETHER FROM CARD,	00021200
	TAPE, OR DISK, WILL NOT BE COMPILED. THAT IS, IF	00021300
	ONE OF THE <LIST OPTIONS> IS SET, THEN THE CARD-	00021400
	IMAGES WILL BE LISTED BUT FLAGGED BY THE WORD	00021500
	"OMIT", AND IF THE "NEW" <OPTION> IS SET, THEN	00021600
	THE CARD-IMAGES WILL BE WRITTEN ON THE "NEWTAPE"	00021700
	FILE.	00021800
		00021900
PAGE	THE APPEARANCE OF THE WORD "PAGE" CAUSES THE	00022000
	OUTPUT LISTING TO BE SKIPPED TO THE TOP OF A NEW	00022100
	PAGE.	00022200
		00022300
PRT	RELATIVE PRT AND STACK LOCATIONS ASSIGNED BY THE	00022400
	COMPILER WILL BE LISTED ON THE LINE PRINTER.	00022500
		00022600
PUNCH	IF A COMPILED CARD-IMAGE CONTAINS A SYNTAX ERROR,	00022700
	THEN THAT CARD-IMAGE WILL BE PUNCHED IN ITS	00022800
	ORIGINAL FORM ON AN ON-LINE CARD PUNCH.	00022900
		00023000
		00023200
		00023300
		00023400
		00023500
SEGS	THE BEGINNING AND ENDING SEGMENT MESSAGES WILL BE	00023600

LISTED ON THE LINE PRINTER. SINCE THESE MESSAGES00023700
ARE AMONG THE THINGS THAT ARE PRINTED WHEN ONE OF00023800
THE <LIST OPTIONS> SET, THIS OPTION HAS EFFECT00023900
ONLY WHEN ALL <LIST OPTIONS> ARE RESET. 00024000

SEQ

00024100
THE LINE PRINTER OUTPUT LISTING, IF ANY, AND THE00024200
"NEWTAPE" FILE, IF ANY, WILL CONTAIN NEW SEQUENCE00024300
NUMBERS. AS EACH CARD-IMAGE IS OUTPUT, IT IS00024400
ASSIGNED A SEQUENCE NUMBER EQUAL TO THE CURRENT00024500
VALUE OF THE <SEQUENCE BASE>. THE <SEQUENCE00024600
BASE> IS THEN INCREASED BY THE VALUE OF THE00024700
<SEQUENCE INCREMENT>. IF THE <SEQUENCE BASE> IS00024800
UNSPECIFIED, THEN A VALUE OF 1000 IS ASSUMED.00024900
IF THE <SEQUENCE INCREMENT> IS UNSPECIFIED, THEN00025000
A VALUE OF 1000 IS ASSUMED. 00025100

SEQERR

00025200
"SEQERR" CAUSES SEQUENCE ERRORS TO BE FLAGGED AS00025300
COMPILATION ERRORS IF THE "CHECK" <OPTION> IS SET00025400

SEQXEQ

00025500
A PROGRAM COMPILED WITH THIS <OPTION> SET WILL00025600
CAUSE EXECUTION TIME TERMINATION ERRORS (E.G.,00025700
DIV BY ZERO, INVALID INDEX, ETC.) TO REFERENCE00025800
THE SEQUENCE NUMBER WHERE THE ERROR OCCURRED00025900
RATHER THAN THE SEGMENT AND ADDRESS. THIS 00026000
<OPTION> HAS MEANING ONLY IF IT PRECEDES THE00026100
FIRST EXECUTABLE STATEMENT, AND IT MAY NOT BE00026200
RESET. ONCE IT HAS BEEN SET, ANY ATTEMPT TO00026300
RESET IT WILL BE IGNORED. OPTION IS SET FOR T/S. 00026400

SINGLE

00026500
CAUSES THE OUTPUT LISTING TO BE SINGLE-SPACED.00026600
WHEN "SINGLE" IS RESET OR NOT SPECIFIED, THE00026700
OUTPUT LISTING IS DOUBLE-SPACED. 00026800

TAPE

00026900
CARD INPUT IS TO BE MERGED WITH TAPE (OR DISK)00027000
INPUT. IF MATCHING SEQUENCE NUMBERS OCCUR, THE00027100
CARD INPUT OVERRIDES THE TAPE INPUT. IF "TAPE"00027200
IS RESET, THE TAPE INPUT IS TOTALLY IGNORED. 00027300

VOID

00027400
THERE ARE TWO METHODS OF VOIDING: 00027500
00027600

A. IF THE <OPTION> "VOID" APPEARS ON A "SET"00027700
CARD, THEN ALL INPUT FROM THE FILES "TAPE"00027800
AND "CARD" IS IGNORED BY THE COMPILER 00027900
(EXCEPT \$ CONTROL CARDS, WHERE THE \$-SIGN00028000
APPEARS IN CARD COLUMNS 1 OR 2) UNTIL "VOID"00028100
IS RESET OR POPPED INTO A RESET STATE. 00028200

00028300
B. WHEN THE <VOID CARD> FORM IS USED, THEN ALL00028400
CARD-IMAGES INPUTTED FROM THE "TAPE" AND00028500

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00028800
00028900
00029000
"CARD" FILES UP TO BUT NOT INCLUDING ANY00029100
CARD-IMAGE WITH A SEQUENCE NUMBER THE SAME00029200
AS THE <VOID RANGE> WILL BE 1) DISCARDED, 2)00029300
NOT LISTED IF LISTING IS BEING DONE, AND 3)00029400

NOT INCLUDED ON ANY "NEWTAPE" FILE IF ONE IS00029500
 BEING CREATED. IF THE <VOID RANGE> IS00029600
 <EMPTY>, THEN ANY CARD-IMAGES WITH THE SAME00029700
 SEQUENCE NUMBER AS THE <VOID CARD> WILL BE00029800
 DISCARDED, ALONG WITH THE <VOID CARD>. IF00029900
 <VOID STRING> OR <PROPER STRING> IS LESS00030000
 THAN EIGHT CHARACTERS LONG, THEN THE 00030100
 COMPILER WILL RIGHT-ADJUST AND FILL-IN 00030200
 LEADING ZEROES (ON THE LEFT). IF <VOID00030300
 STRING> OR <PROPER STRING> IS MORE THAN00030400
 EIGHT CHARACTERS LONG, THEN THE COMPILER00030500
 WILL USE ONLY THE FIRST EIGHT CHARACTERS (ON00030600
 THE LEFT). 00030700

EITHER THE <OPTION> FORM OR THE <VOID CARD>00030900
 FORM SHOULD BE USED EXCLUSIVELY. IF BOTH00031000
 FORMS ARE INTERMIXED, THEN THE RESULTS WILL00031100
 BE UNPREDICTABLE. 00031200

VOIDT

THIS METHOD OF VOIDING IS IDENTICAL TO USING00031400
 "VOID" (SEE ABOVE) WITH ONE EXCEPTION, ONLY CARD-00031500
 IMAGES FROM THE "TAPE" FILE WILL BE VOIDED. ANY00031600
 CARD-IMAGES FROM THE "CARD" FILE WHICH FALL00031700
 WITHIN THE <VOID RANGE> OR FALL BETWEEN THE00031800
 SETTING AND RESETTING OF THE "VOIDT" <OPTION>00031900
 WILL BE COMPILED. 00032000

XREF

OPTION WILL PROVIDE A IDENTIFIER CROSS-REFERENCE 00032010
 LISTING AT THE THE END OF THE COMPILATION. IT IS 00032020
 RECOMENDED THAT THIS OPTION BE SETPRIOR TO 00032030
 TO THE FIRST "BEGIN" OF THE PROGRAM AND RE- 00032040
 MAIN SET UNTIL END OG PROGRAM. 00032050

EXAMPLES:

 \$CARD LIST SINGLE 00032200
 \$TAPE LIST SINGLE PRT CHECK SEQXEQ 00032300
 \$ DEBUGN TAPE 00032400
 \$ SET LIST PRT TAPE 00032500
 \$ RESET TAPE, PRT 00032600
 \$TAPE NEW PRT 00032700
 \$\$SET LIST,SINGLE, RESET PRT, NEW 00032800
 \$RESET LIST 00032900
 \$TAPE NEW TAPE 00033000
 \$ INFO 00033100
 \$ PAGE 00033200
 \$ RESET TAPE PAGE 00033300
 \$ SET INFO CHECK 00033400
 (INFO TABLE WILL BE DUMPED, INFO CANNOT BE SET/RESET) 00033500
 \$\$SET OMIT=DEBUGGING 00033600
 \$ SET OMIT=NOT ALGOL 00033700
 00033800
 00033900
 00034000
 00034200
 00034300
 00034400
 00034500
 \$ SET OMIT=DUMDUM 00034600
 \$SET OMIT=NOT PRT 00034700

\$ POP OMIT
ADDITIONAL DOLLAR-CARD SIDE AFFECTS IN ALGOL

1. A NINES CARD IS NO LONGER NEEDED IN A PATCH DECK WHEN MERGING WITH TAPE INPUT.
2. THE "CARD" INPUT FILE IS CLOSED IMMEDIATELY AFTER THE "END-OF-FILE" CARD IS READ, INSTEAD OF AT END OF COMPILATION.
3. "SGL" IS NO LONGER RECONIZED AS A RESERVED DOLLAR CARD OPTION. "SINGLE" MUST BE USED.
4. UNRECONIZED OPTIONS ARE ASSUMED TO BE USER DEFINDED DOLL-CARD OPTIONS.
5. THE NUMBER OF CARDS PROCESSED IS NOW PRINTED AT THE BOTTOM OF THE COMPILE TIME LISTING. (IF LISTING REQUESTED)
6. "\$VOID" MAY NOW BE USED TO VOID RECORDS IN THE MIDDLE OF A COMMENT.

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00036400
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00036700
00036800
00036900

LABEL 00000000LINE 00177112CC EX 0/R;COMMON=1;FILE S=ADOLAR/APTLIB;END←

0 /R