



the **MOBY**
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The official organ of the TECO Special Interest Group

Issue #1

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Contributions and correspondence should be sent to the editor:

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SYMPOSIA NOTES

Impetus to start a TECO SIG was generated at the Spring DECUS symposium. We had a hefty group of over 50 people show up for a TECO GURUs session. We collected names and signatures and John Alderman agreed to act as SIG chairman.

We also had a demonstration by Herb Jacobs of his new VT52 support for TECO-11. Everyone was impressed.

There was also a TECO tutorial given. It was attended by about 50 people (mostly RT-11 users) and was a big success. We hope to continue to sponsor these tutorials at future conventions.

There was much discussion about starting up a procedure by which users would distribute versions of TECO which DEC did not want to release as products. We did not follow up on this since it soon became apparent that TECO would ship with RT-11 and IAS (although as unsupported products). We plan to discuss this further at the Fall symposium.

The DECUS Fall Symposium will be held this year in San Diego. The TECO SIG has an organizational meeting scheduled for Wednesday, November 30, from 2 PM to 3 PM. We hope you can all attend.

We will spend the first half hour talking about organizational matters. We will need several volunteers to handle SIG activities. We will need a SIG coordinator, a library chairman, etc. If you are interested in helping the SIG but cannot attend our meeting, please drop a note to either Stan Rabinowitz or John Alderman.

In the second half hour, we hope to have a few informal talks given. There are still slots open. If you would like to give a 5 or 10 minute short talk on some TECO topic, just be prepared and we'll make time for you.

There will most likely also be several 'birds of a feather' TECO sessions scheduled.

Copies of various versions of TECO will be available, so if you want them, come prepared to copy them. We will probably have them available on two media; most likely is magtape, and perhaps DECTape.

Readers are urged to submit articles, techniques, notes, hacks, ideas, comments, or criticisms about TECO to the TECO SIG newsletter.

NOTES FROM RSX

The V3 release of RSX-11/M contained TECO V24. TECO is not a DEC-supported product. No manual for TECO was included in the RSX manual set, however the TECO manual distributed in the DECUS 11-288 kit should suffice to tell you everything you need to know to use and run TECO under RSX-11/M.

Version 28 (or maybe V29) of RSX-11/M TECO will shortly be submitted to DECUS, along with a manual and the source of the RSX TECO I/O module. We will let you know when this happens via this newsletter.

NOTES FROM TOPS-10

TECO is a DEC-supported product on the DECSYSTEM-10, although very little work is being done on it. Fortunately it is very stable with little or no bugs in it.

Version 23C(175) has recently been released. This version has very little different from V23B, and in fact, all the changes only affect the ER, EW, EB, EZ, EX, EG, and EM commands. V23C understands default paths, SFD's, libraries, ersatz devices, and some new switches such as /SCAN, /NEW, /NOCREATE, /NOWRITE, and /SYS.

On the EB command, the new source, the .BAK file, and any .TMP files will now always appear in the area specified in the EB command (they used to go into the user's area). The new source (and .TMP if any) will have the same protection as the old source. The .BAK file gets the same protection as the previous .BAK file if one existed, otherwise it gets the same protection as the input source, with the owner field lowered if necessary to allow owner deletion.

If a file is found in a library (such as NEW:), TECO will treat it as a read-only file.

The current version of TOPS-10 TECO is version 24(202) which was released in March of 1977. More information about this version will be given in our next newsletter.

NOTES FROM IAS

TECO V28 was distributed with IAS V2.0 . However, TECO is not a DEC-supported product. Also distributed was VTECO, a version of TECO containing a VT52 scope driver.

Problems with TECO type-in

There is a bug in IAS TECO's terminal type-in code that causes some characters to be entered incorrectly. This bug is corrected using the following TKB patch (IAS TECO patch #1):

```
GBLPAT=DATA:TLISTN+500:121427
GBLPAT=DATA:TLISTN+506:121427
GBLPAT=DATA:TLISTN+514:112714
GBLPAT=DATA:TLISTN+520:121427
GBLPAT=DATA:TLISTN+526:142714
```

Edit these five lines into the command file, TECBLD.COMD, immediately preceding the last line in the file and then rebuild TECO.

The same patch works for the build file for VTECO.

NOTES FROM OS/8

TECO V5 was recently released with OS/8 V3D. Considerable work has been done on it to make it more compatible with the TECOs on the -10 and -11. The most notable improvements are: improved error messages, improved precision, scope support, and data protection for the Yank command. Details about the differences between V4 and V5 can be found in an article elsewhere in this newsletter.

OPTIONAL PATCH to change the default EH value

In OS/8 TECO V5, as on the PDP-10 and -11, the default value of the EH flag is 0, which is the same as 2. This value causes the one-line form of an error message to print upon encountering an error. This could be annoying to experienced users with slow terminals. Naturally, you can change this at run-time by executing the LEH command which causes only the 3-character error message code to print thereafter. Users who wish to cause the default value of the EH flag to be permanently set to 1, can install the following patch:

```
.GET SYS:TECO
.ODT
4572/0000 1
↑C
.SAVE SYS:TECO
```

OPTIONAL PATCH to remove Yank protection

Probably the most common way to lose data in TECO is to accidentally type 'Y' when you meant to type 'T'. OS/8 TECO V5 has included what is know as Yank protection, first implemented on the PDP-11. Yank protection causes the error message ?YCA (Yank Command Aborted) to be produced any time that the Y or _ command is issued and there is text in the text buffer and there is an output file open. If all these conditions are met, it is presumed that you are about to lose some important data, and so the command is rejected. Note that the Yank is always legal if the text buffer is empty or if no output file is open. If you really want to do the Yank, you can always type HKY, a command which will always succeed.

The PDP-11 also put in a feature which allows you to turn off Yank protection (set ED, the edit level flag, to -1). Unfortunately, there was not enough time (or room) to implement this feature in OS/8 . [It will probably make it into the next release.]

In the mean time, people who do not wish to have Yank protection, can patch it out of TECO by installing the following patch:

```
.GET SYS:TECO
.ODT
2032/7640 7610
↑C
.SAVE SYS:TECO
```

OPTIONAL PATCH to change the default EU value

In OS/8 TECO V5, the default value for the EU flag is 0 (unless .SET TTY SCOPE has been specified to the KBM, in which case the default value is -1.) Users who wish to permanently change the default value to be -1 (no case flagging) may install the following patch:

```
.GET SYS:TECO
.ODT
4576/0000 7777
2245/7650 7200
↑C
.SAVE SYS:TECO
```

NOTES FROM RT-11

RT-11 TECO Version 28 is included in the RT-11 V3 kit as an unsupported product. Also included is a manual that is applicable to all the PDP-11 TECOs. Note that this manual describes version 27 of TECO-11 and that the changes for V28 can be found in the RT-11 release notes. Also in the release notes manual can be found a macro, which, when used in conjunction with the VT52 support in TECO, gives the user immediate mode keypad editing on a VT52.

This macro, in machine readable form, will be included in the RT-11 V3 TECO kit that is being submitted to DECUS and will probably replace DECUS 11-288. The new source of the RT-11 TECO I/O module will also be included.

Changes have been made to the $\uparrow W$ command to accommodate VT52 support. [VT11 support remains unchanged.] The VT52 screen shows a portion of the text buffer including lines before and after the current text pointer. The screen is automatically updated each time TECO goes back to command level. In addition, the user can cause the screen to be updated from within a macro via use of the $n\uparrow W$ command.

For a VT52, the $n\uparrow W$ command works as follows:

$n\uparrow W$ where n is positive specifies that the line containing the current text pointer is to be displayed on the n th line of the VT52. n should be between 6 and 23 inclusive. The default display corresponds to $16\uparrow W$.

$0\uparrow W$ is the same as $16\uparrow W$.

$-1\uparrow W$ causes a VT52 screen update. Note that the VT52 support remembers what characters were previously on the screen and only changes those characters which have changed.

$n\uparrow W$ where $-23 \leq n \leq -2$ performs a screen update but forces the first $|n|-1$ lines to be redisplayed even if they hadn't changed. (This might be useful if the macro had performed output to the screen which destroyed the integrity of the window into the text buffer.)

NOTES FROM RSTS/E

TECO-11 has been running under RSTS/E in-house at DEC for quite a while now, however it is not currently available from DEC. At the last DECUS symposium, we talked about the feasibility of distributing RSTS TECO through users and we will follow up on this proposal at San Diego. We expect to have version 29 available at the

SIG meeting to anyone who wishes to copy it. We are also trying to convince the RSTS group to release it with the next RSTS/E release.

PROBLEM READING RMS FILES

RSTS TECO V28 cannot read certain RMS files. This bug will be corrected in version 29.

DIFFERENCES BETWEEN TECO-11 V28 and V27:

TECO-11 V28 contains the following new features:

- a) New use for colon modifier.
The X and ↑U TECO commands may now be colon modified. The colon modifier, in these cases, indicates that the specified text is to be appended to the end of the contents of the specified Q-register. (Without the :, the Q-register gets loaded and its previous contents are lost.)
- b) New match control construct.
The construct ↑EGq now has new meaning when encountered within a search string. This construct matches any character which belongs to the group of characters contained within Q-register q. For example, if Q-register A contains the text string, abcd, then the command S↑EGA\$ would search for the first occurrence of one of the letters a, b, c, or d in the text buffer (following the pointer). This example is equivalent to the TOPS-10 TECO command
S (↑E) [a,b,c,d]\$.
- c) Two new ET bits have been defined.
Bit 9 (representing 512) if on indicates that the terminal is a VT52 and that VT52 support code has been configured into TECO.
Bit 10 (representing 1024) if on indicates that an auxiliary VT11 is present and that VT11 support code has been configured into TECO.
Both bits are read-only.
- d) Revision to ↑C trap code.
Now, if ↑C trapping is enabled (bit 15 of ET flag on), and ↑C is typed to a pending ↑T, then bit 15 is turned off and a 3 is returned to TECO. TECO continues to execute. (In previous versions of TECO-11, the ↑C would abort TECO command execution in this case.)

TECO MACRO OF THE MONTH

```
+ØUn Qn"E2ØUn' ØUh ØUv HK
Qn<J ØUq Qn*1Ø/3Ui
Qi<\+2*1Ø+(Qq*Qi)Ua ØLK Qi*2-1Uj Qa/QjUq Qa-(Qq*Qj)-2\1ØI$ Qi-1Ui>
Qq/1ØUt Qh+Qt+48Uw Qw-58"E48Uw %v' Qv"NQv†T' QwUv Qq-(Qt*1Ø)Uh>
Qv†T
```

The above macro should run on the PDP-8, PDP-1Ø, and PDP-11 with the following exception: TOPS-1Ø TECO and older versions of OS/8 TECO do not have the n†T feature. This command types out the character whose ASCII representation is n. For TECOs which do not have this feature, it can be easily simulated as specified below:

```
n†T  =  nI$ .-1,.T -D
```

This month's macro was written by Stan Rabinowitz with modifications by Mark Bramhall and has been submitted without comments or explanation.

Readers are urged to submit worthy macros to the editor for possible inclusion in this column. Each issue, the editor will select the 'best' one received (if any) and print it, thus giving great fame and recognition to its author. The selection will be based purely on the subjective whim of the editor, and his decision will be final. (But I can tell you right now - usefulness is not an important criterion.) Non-standard TECO features should be avoided, unless essential to the hack-value or beauty of the submission. Macros over 1ØØ characters long should be submitted in machine-readable form along with a neat listing.

TECO DOCUMENTATION AVAILABLE FROM DEC

TOPS-10: DEC-SYSTEM-10 TECO PROGRAMMERS REFERENCE MANUAL
DEC-10-UTPRA-A-D
available from SDC

OS/8: OS/8 HANDBOOK, pp. 2-132 to 2-184.
DEC-S8-OSHBA-A-D

OS/8 HANDBOOK UPDATE pp. 20-25.
DEC-S8-OSHBA-A-DN4

both available from SDC

PDP-11: PDP-11 TECO User's Guide July 1977
DEC-11-UTECA-A-D
DEC-11-UTECA-A-DN1 (update notice no. 1)
available from SDC

NOTE: Although the cover of this manual claims it represents TECO V28, this is wrong. The V28 refers to the fact that the software distributed with RT-11 is V28; however, the manual actually describes TECO V27.

RT-11: RT-11 TECO RELEASE NOTES
DEC-11-ORTNA-A-D
comes with RT-11 kit and supplements the User's guide.

BEGINNER'S COLUMN

At the last few DECUS symposia, we found a lot of people interested in learning TECO. For these people, we hope to publish a column which will talk about common tricks and techniques which are old-hat to the experienced users. Material is solicited for this column for the next issue.

Although TECO is very complex, it turns out that a small subset of commands is enough to allow you to perform all your every-day editing functions. Specific information on novice subsets of TECO can be found in the following documents:

TOPS-10: INTRODUCTION TO TECO, DEC-10-UTECA-A-D

OS/8: OS/8 HANDBOOK, pages 2-132 to 2-141.

PDP-11: TECO User's Guide, Chapter I.

VT8-E TECO

Bob Harper has sent in the following information about a version of OS/8 TECO which uses a VT8-E:

For those of you wierd people with VT8-E's on their machines, the P?S has available a version of OS/8 TECO V4 with VT8-E support. The code takes full advantage of the features of the VT8-E in a manner similar to GT-4Ø TECO on the PDP-11. If a VT8-E is indeed present on your system and at least 12K of core is available, TECO will come up on the VT8-E; if either of these conditions fail, TECO will come up on the console in the usual fashion. The sense switch is used to arbitrate which display mode is in effect. The user can either select a text buffer display window or a command/user-input display. The ↑W command is supported (a la VR14 TECO) for immediate display update and for controlling the number of lines per screen to display. One field is stolen for the two display buffers, so if you have 12K, TECO will be limited to using 8K, whereas if you have 16K, TECO will be given 12K so that increased Q-register space will be used.

If anyone is interested, contact Bob Harper directly. His address is:

Bob Harper
2Ø Diamond Street
Naugatuck, CT Ø677Ø .

COMMENTS FROM BOB HARPER

Bob also sent along some comments.

1. Page 42, 3rd paragraph of TECO-11 V27 manual has a typo. "apostophe" should read "apostrophe". Also, on page 58, the comment on the 1ØU1 line would be clearer if it read ! Put a 1Ø (if radix is decimal) or 8 (if radix is octal) into Q-register 1 !

Agreed. - Ed.

2. There should be a command to insert an arbitrary character into the text part of a Q-register, as with the nI\$ command. I suggest n↑Uq\$ and n@↑Uq// .

This seems very reasonable and consistent with other parts of the language. I am told that this feature will probably go into version 29 of TECO-11. - Ed.

3. There should be a command to get a line of input (from the terminal or indirect file) and put it into a Q-register, so that the usual editing features (RUBOUT, CTRL/U) are available without simulation by a macro and so that the text buffer need not be used. This feature would be great for things like ADDCOM macros.

An interesting idea. However, what you probably need is a TECO macro library. This would make a wonderful addition to such a library. - Ed.

4. To reiterate an old argument, the 'PW' command is inconsistent with the language and should be replaced by, say, a 'W' command. All TECO commands are either 1 character or 1 character followed by one of a set of characters (as in the 'E' command). Therefore 'PW' is inconsistent since only 'W' (or nothing) may follow. The '==' command also falls into this category. Some other technique for local radix change should be implemented.

We never claimed TECO was consistent. 'traditional' and 'cryptic' might be better adjectives. - Ed.

5. The 'F' command should not be disallowed. 'F' should be generally allowed as a preface to the search commands (as with '@' and ':').

The -10 people seem to disagree and so do the -11 implementors. The -11 people convinced the -8 people that the command was useless, so F was removed from OS/8 TECO. Also, the presence of the FR command on the PDP-11 would mean that F couldn't become a general modifier. It appears that F is heading the same way as E. - Ed.

6. The use of ':' in the ':G', ':Q', '::', and '==' commands is inconsistent. As we all know, colon means "try to perform this function; if you fail, don't bomb out; let me know if it succeeded or not". The addition of ':ER' and ':[' is quite welcome! The functions provided by the ':G', ':Q', '==', and '::' commands are very useful but some other syntax should be defined.

What do you suggest? The PDP-11 people seem to be treating : as a general purpose modifier which modifies a command to a similar, but slightly different, command. - Ed.

7. The CTRL/V and CTRL/W commands should be implemented in TECO-11 as in TOPS-10 TECO V23.

The -11 people don't seem to care too much for case control since most of DEC's new terminals support lower case. - Ed.

DIFFERENCES BETWEEN OS/8 TECO V4 and V5:

Features added to OS/8 TECO for TOPS-10 TECO compatibility:

- (i) New conditionals "T, "S, "F, and "U added.
- (ii) 3-character error message codes implemented along with short one-line English explanations. Error message format controlled by EH flag. 3EH not implemented; 2EH works only on systems with at least 16K of memory.
- (iii) = and \ commands return signed results (decimal radix only).
- (iv) P command never creates form feeds that weren't initially present.
- (v) F is no longer a modifier. Now it must be followed by an S or an N, or an error message results. [In TECO V4, F was a command which affected the action of a subsequent, but not necessarily adjacent, search command.]
- (vi) Except on a PDP-12, the W command now gives an error message. [In V4, the W command was ignored.]
- (vii) Case flagging implemented, controlled by EU flag.
- (viii) == command implemented (types in octal).
- (ix) ↑N end-of-file flag implemented.
- (x) Image mode typeout permitted via use of LET command.
- (xi) Vertical tab and form feed are now end-of-line terminators (in addition to line feed).
- (xii) The ↑K command now results in an error message. [This command was ignored in V4.]
- (xiii) A negative or 0 iteration count causes the iteration to be skipped.
- (xiv) It is now an error to do an EB on a .BK file.

Features added to OS/8 TECO for PDP-11 TECO compatibility:

- (xv) New conditionals "R, "<, and "> added.
- (xvi) If no iteration count is specified to an iteration, the count is now truly infinite. (In V4, the default iteration count was 4096.)
- (xvii) n↑T command implemented.
- (xviii) := and :=: commands implemented.
- (xix) @ modifier allowed on ER, EW and EB commands.
- (xx) EK command implemented.
- (xxi) :G command implemented.

- (xxii) Y and _ protection installed. These commands abort if the text buffer is not empty and an output file is open. Unfortunately, this protection can not be removed by the ED flag.
- (xxiii) Command level scope editing implemented.
- (xxiv) ↑C typed during macro execution now returns control to TECO. Typing ↑C to TECO's * returns control to OS/8.
- (xxv) Echoing to ↑T input can be suppressed via bit 8 (representing 8) in the ET flag.

Commands removed from OS/8 TECO to improve compatibility with other TECO implementations:

- (xxvi) ↑R removed (same as FS).
- (xxvii) "A and "B removed (no longer necessary now that 13-bit arithmetic precision supported).
- (xxviii) ↑Z removed (unnecessary command which conflicts with TOPS-10 TECO.)
- (xxix) ↑V changed to EO.
- (xxx) ↑W changed to W.

↑V and ↑W were changed to resolve incompatibility with TOPS-10 TECO. Although it was felt that TOPS-10 was the culprit (they implemented ↑V and ↑W long after OS/8's use was established), the TOPS-10 use is more consistent with other case control commands and fewer macros would have to be modified if OS/8 changed.

- (xxxi) F_ was removed because the PDP-11 people complained about its impracticality. [They seem to have changed their minds; and it seems that F_ will probably appear in V29 of TECO-11.]

New features added to OS/8 TECO:

- (xxxii) Arithmetic precision has been improved so that range of signed numbers is now -4095 to +4095 (used to be -2047 to +2047).
- (xxxiii) An error message is generated if a numeric argument is specified to a Y command.
- (xxxiv) A CTRL/S typed during output will freeze the output until a CTRL/Q is typed.
- (xxxv) The EGtext\$ command was implemented. It is the same as the EG\$ command but causes the specified text to be passed to OS/8 to be executed as a KBM or CCL command.

MACROS AVAILABLE FROM DECUS

Readers are urged to submit useful TECO macros to the DECUS library. Submissions should be made through the usual channels. There is currently no TECO language category so the program or macro should be submitted under the category determined by the machine or operating system upon which development was performed. Be sure to specify in the abstract that the source language is TECO and specify which other operating systems it will run on.

Currently Available:

DECUS 11-288 (RT-11 TECO V24).

This submission contains a few macros which may be of some interest to non-RT-11 TECO users. A few of the macros contained therein are summarized below:

INSERT allows immediate-mode editing on VT11 or VS60 display

EDIT loads up INSERT and other macros and remembers the filename used by its previous invocation (useful on operating systems where the system does not 'remember' the argument on the last TECO command)

LOCAL takes a MACRO-11 assembly language source program and puts the local symbols in each local symbol block into numerical order

SORT sorts lines of text in the text buffer (using a key). Slow but effective.

TECO TECHNIQUES

This column will cover interesting tricks or techniques which readers would like to share with others.

I was recently confronted with the problem of removing all the spaces from an exceedingly large file (several hundred thousand characters and no form feeds). The straightforward solution: <N \$;-D> would take too long to be practical since each -D would cause all the characters above the current one to shift down.

The following solution was practical:

```
TECO filename
*I<FN $ 27I$ ØI$ 27I$ I;>EX$ ØXA ØK MA$$
TECO filename
*EX$$
```

[continued page 17]

On 24-July-1975, I did a compatibility study of the various TECO's generally available around DEC (TOPS-10 TECO, OS/8 TECO, and TECO-11). The conclusions reached were as follows:

| | |
|------------------------|-------------|
| Total compatibility | 51 commands |
| Subset compatibility | 34 commands |
| Slight incompatibility | 26 commands |
| Major incompatibility | 6 commands |

We held various compatibility meetings amongst the TECO implementors and reached many conclusions, as well as several standoffs. Our main problem was that we could not find anyone in -10 land at that time (or now) who would commit to making changes in TECO. However, my hopes are still high. If anyone from -10 land is reading this and would like to resume compatibility talks with the -8 and -11 worlds, please get in touch with me.

Looking over the situation today, I find that there has been some improvements. There are now 58 commands that are totally compatible amongst all DEC TECOs and only 5 commands that exhibit gross incompatibilities. [The major incompatibility that was fixed up was the incompatible use of "A which the PDP-8 world recently removed.]

The following 5 commands behave radically different on various TECO implementations and users are urged to avoid these commands whenever possible (because eventually they might change):

- 1) ↑V This is a case control command on the -10, a version number command on the -11, and unused on the -8.
- 2) ↑W This is a case control command on the -10, a scope control command on the -11, and unused on the -8.
- 3) n↑W This is a case control command on the -10, a scope control command on the -11, and unused on the -8.
- 4) m n (Space operator)
When used between digits, this is the same as m+n on the -10, but on the -8 and -11, the space is ignored.
- 5) ↑Z This is an I/O close command on the -10, returns a value on the -11 (number of characters used by Q-register storage), and unused on the -8.

I make the following personal recommendations concerning how to clear up these 5 incompatibilities:

- a) TECO-11 should change Watch command (scope control) from ↑W to W.
- b) TECO-11 should change version number command from ↑V to EO.
- c) TOPS-10 should ignore spaces between digits.
- d) All TECOs should drop use of ↑Z command.

I have already modified OS/8 TECO (V5) to conform to these recommendations.

At previous DECUS symposia, I have distributed a memo, entitled TECISS.TXT which lists 35 compatibility issues along with the pros and cons associated with various proposals for ironing out these differences. I don't have the time to discuss these all in this column, so I will just list the titles of these issues. I will discuss them in future columns in more detail. (Note that some of these issues have already been solved.)

- 1. Implementation dependent date
- 2. Implementation dependent time
- 3. Incompatible form feed command
- 4. Radix control problem
- 5. Obsolete use of ↑R
- 6. Incompatible ↑V command
- 7. Incompatible ↑W command
- 8. Incompatible ↑Z command
- 9. Space problem
- 10. Incompatible "A command
- 11. Definition of alphanumeric character
- 12. Generalization of % command
- 13. Unspecified repeat counts for iterations
- 14. = problem
- 15. Generalized nA command
- 16. Location of @
- 17. Filespecs treated as text
- 18. EH value is implementation dependent
- 19. ET value is implementation dependent
- 20. Closing of files with EW
- 21. Required altmode on nI
- 22. Passing values through macros
- 23. Negative arguments to searches
- 24. Strange W command
- 25. Alpha and numeric Q-registers

26. Assumed ; after searches in iterations
27. Concatenated commands which return values
28. Checking for erroneous number of arguments
29. End-of-line character
30. Echoing of bell
31. *Z command is (↑S) on PDP-8
32. Vertical tab command
33. Partial error reporting with ?
34. Assumed : modifier for searches in iterations
35. F modifier on PDP-8

BUG IN TECO-11:

The "V and "W conditional commands in TECO-11 V28 are implemented in the reverse manner from TOPS-10 TECO. Presumably, this is a bug in TECO-11 and will be fixed in V29. The traditional (TOPS-10) meaning for these commands is as follows:

- n"Vcmds' If n is the ASCII code for a lower-case alphabetic character, execute the commands specified.
- n"Wcmds' If n is the ASCII code for an upper-case alphabetic character, execute the commands specified.

Users who discover other incompatibilities between existing TECO implementations should send them to me, so that I can report them in future newsletters. In that manner, other TECO users can be made aware of these problems and can avoid using incompatible commands in any TECO macros that they intend to transport across operating systems.

TECO TECHNIQUES (continued from page 14)

This procedure creates a macro which replaces all blanks with nulls (using an FN command which is very fast since no characters have to shuffle down). A second pass through TECO then removes all the nulls.