DITG; BYTESBPIKELS

LIMÀ 99/4A USERS GROUP



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CSJ-FIGURE AM OUTCOMOTIC CASSETTE TAPE PROGRAM LICCATION SYSTEM

a review by Charles Good

This one is for cassette tape users and for those isterested in unusual programming techniques. Have you ever wondered if it was possible to mark with software the position of a specific program on a cassette tape full of many grograms and then have the computer search the tape from the beginning until the specific desired program is found? TI did ence develope such a system for its 99/8 computer, but TI's WAFERTAPE drive was never released. Coleco ADAM computers accessfully use such a system. Not so for the 7199/6A, according to many well respected comentators. I have read again and again in our exchange newsletters expert comment to the effect that with the TI there is no way to automatically, under software control, advance a long caseette tape to the exact physical location where a program starts. Well..... way back as early as 1983 Joseph E. Sartle of Parish NY wrote a TI BASIC program that does this for the TI! I recently acquired a copy 1985 update of Joe's COINFINDEX program (still entirely in TI BASIC with mo assembly routines) and after removing a few bugs I am quite impressed with capability of this software.

CSIAFINDEX will do its stuff even if you don't have a printed list of which programs are on a program tape, wwen if you are using a tape recorder that does not have a numerical tage counter, and even if you are using a tape recorder that is not automatically controlled on/off by the 99/46. CS19FINDEX finds semiautomatically the exact location of a program on a long tape. The manual tape recorder operations required of the user are all prompted from the screen. If you are using a TI compatible recorder, CS1#FINDEX will advance the tape to your program's location after you press fast foreward, and then automatically stop the tape. If you are using a tape recorder that the II cannot automatically turn on and off, CS1#FINDEX will turn the screen from green to 'yellow and finally to red to indicate when you should manually press cassette STDP once the location of your pregram has been reached. Neat!

With CS1*FINDEX you can create a catalog of up to 10 programs you want to put on one side of a C60 tape and put this catalog at the beginning of the tape. The catalog includes program name (up to 12 characters with spaces enywhere), and there is also provision for catalog to display a 12 chracter comment for each of the 10 programs. You can then put your up to 10 programs onto the tape, with CS1*FINDEX advancing the tape recorder to the correct tape location where you should SAWE CS1 each program. It is

nonneary to reload CS10FINDEX for each of the programs you got on the tape. Thus, users with only a console/cosutte system will appreciate the fact that CS10FINDEX is designed to be small enough to load into the MINIMEMORY module with GAME HINIMEM. Then each time you need to load CS10FINDEX, all you do is type OLD MINIMEM, and CS10FINDEX boots in a few seconds. Otherwise it takes about 90 seconds to load CS10FINDEX from tape.

Later, when you want to use the tape you load CS1#FIMMEN into the computer and then load the tape's catalog from CBISFINDEX. From the catalog display you select the number of the desired program on the tape. You are then instructed to rewind the tape to the beginning and press FAST FOREWARD. C\$10FINDEX them advances the tape to the program's location, automatically stops the tape if you are using a TI compatible recorder, displays the name of your program on the screen, and informs you this program has been located. CRIOFINDEX BREAKs to command mode and allows you to load your program in the normal way by typing OLD CS1 and following all the usual screen instructions, except that you DO NOT again "wowind cassette tape". CS1#FINDEX can easily be modified in extended basic to load the located tape program into the computer from within CS1#FINDEX rather than from command made. Change line 1770 to read RUN "CSI".

If you already have a printed list of each program on the tape and in which order the programs occur, you can bipass the catalog loading procedure. When you RUN CS1*FINDEX your first option is "LOCATION SEARCH (Y/N)". From here you can use CS1*FINDEX to locate the first or second or third. etc. program on the tape without using time to boot the catalog.

mat's the secret? How does CS1#FINDEX using only TI MAGIC with no assembly routines do what all the experts say can't be done? Have you ever noticed how the tape recorder behaves when you read or write tape serial FILES (as opposed to PMDGRAMS)? The recorder starts, reads in or writes what I presume to be a file header, then stops. Then the recorder starts again and reads or writes the first record and then steps. Then the recorder starts again and reads or writes the second record and then stops, etc, etc. The total number of start/stop cycles equals the number of records plus one. The computer controls the turning on and off of the tape recorder motor and IT DOESN"T MATTER TO THE COMPUTER IF THE RECORDER IS SET FOR PLAY OR FOR FAST FOREHARD. searching for a program, CSI#FINDEX writes a false file to the tape, turning the tape recorder motor on and off several times as this file is written. The tape recorder is set for FAST FOREWARD rather than for RECORD as this file is written,

NEXT PAGE

se the time never receives any data. The computer cannot directly sense that the tape is not getting any data, so the complifer continues to turn the recorder motor on and off as it writes its fake file to the tape. When turned on, the tape advances very rapidly because the recorder is set for FAST FOREWARD. A tape file designed to write up to 10 records with a record length of 192 will go through up to 11 start/stop sequences on a C60 tape before the tape is completely wound up on the take up reel. This is how CSISFINDX locates physical blocks of tape space in which to insurt programs, and can later find a specific program located at any one of these physical blocks of tape space. The first block (corresponding to the false file's header) is where the catalog is stored, and the next 10 blocks leach corresponding to a false file record) are where the programs are stored. Enough space is included in each of the program storage blocks to store the largest possible tape PROGRAM.

LIMITATIONS: 1—You can't use CS1*FINDEX with already existing program filled tapes. The spacing of the programs on the tape won't be right. You need to load programs onto your program storage cassette tapes using CS1*FINDEX. 2—Problems may occur if different tape recorders are used to store and later play programs. If the FAST FOREWARD speed of the two recorders differs very much CS1*FINDX will not correctly find the location of the desired program. 3—There is only room for a short program in the last (10th) program block before the tape runs out.

The author of CS1*FINDEX has written some rather wordy documentation files to explain the use of CS1*FINDEX. These files are in PROGRAM format so that they can be loaded from tape and read by console/cassette-only users. In general most users can play around with the program and figure out how to use it without these docs. A sample tape program finding catalog is printed below as is the CS1*FINDEX program listing (chackenes added using EI-KEY* FLORY with permission

(165)

of the author Joseph E. Bartle. It is released to the TI community as FAIRWARE. If you like it, send whatever you think, it is worth to Joe at the address in the REM statements at the beginning of the program. Joe has other fairware offerings. Write or call him for details. User groups, not individuals, may obtain a copy of CS1#FINDX and the above mentioned doc files by sending a disk and paid return mailer to the Lima User Group, P.O. Box 647, Venedocia CH 43894

SAMPLE PHOEZ CASSETTE CATALOS

CATALOG

OHITEOU					
NUM		PROGRAMS			
1	٠	3D TICTACTOE			
2	٠	BASEBALLSTAT			
3	*	DRAW			
4	*	FUN HOUSE			
5	٠	MEMORY JOB			
6	•	SPELL QUIZ			
7	~	BOLFHANDICAP			
8	٠	LIGHT YEARS-			
9	•	PHOTO DIARY-			
10	٠				
		REMARKS!			
11	R	TIB			
12	R	TIB/DATAFILE			
13	R	TIB TEACHING			
14	R	XB/JS OPTION			
15	R	TIB/DATAFILE			
16	Ř	TIN/DATAFILE			
17	R	11B			
18	R	TIB			
17	Ř	118			

60 REM TI BASIC	
65 REM FAIRWARE, If	ou like
this program please	sené a
donation to JOSEPH E.	MATLE
at the address below	. (183)
80 REM 16 SEE TRAILOR	CT
,	(243)
100 REM PARISH, NY 131	31
***	(109)
110 REM 315-625-4409	(59)
112 REM Originally wr	
983, revised 1985	(43)
115 REM Minor modific	
by Charles Good, DEC	
	<164>
117 REM Remove line 1	70. and
all REM lines includi:	
ta fit into MINIMENON	
	(215)

50 REM CS18FIMMEY

120 CALL CLEAR	(207)
130 \$="	4 (136)
140 CAF"CATALOS"	(238)
150 LC\$=*LOCATION SE	ARCH"
	<11 8 >
140 DEF LF=LEN(F\$)	₹133>
170 T=1000	(157)
100 DIN PG\$(19)	(230)
190 DISPLAY TAB(6); "1	ASSETTE
FINDEX": :TAB(6);"Jo	seok E
Martle": : : : : : :	111
	(132)
200 50SUB 1900	(195)
210 CALL CLEAR	(209)
220 PRINT LCS&" Y/N"	
230 INPUT ANS	(47)
240 IF ANS="Y" THEN 1	
	(112)
250 DISPLAY	(142)

C\$		(102)
270	INPUT ANS	(44)
200	IF ANSCHUT THEN 47	70
		(39)
290	60SUB 1320	(125)
300	60SUB 740	〈54〉
310	CALL CLEAR	(207)
320	RESTORE 1930	(238)
330	MI=1B	<135>
340	GOSUB 1840	(135)
350	CALL KEY(0,OP,S)	(15)
340	IF (OP(49)+(OP)53)?	THEN 3
50 (ILSE 390	(238)
370	IF S=0 THEN 350	(102)
380	T=1000	(159)
370	ON OP-48 GOTO 400,4	170,62
6,6	10,710	(188)

(201)

400 CALL CLEAR

260 PRINT "DOES TAPE HAVE ":

,	non-cut tentación	W
: :	11111	(133)
470	50509 1900	(195)
430	60SUB 830	(145)
440	60SUB 1790	⟨84⟩
450	IF C=0 THEN 310	(46)
440	GOSUB 1520	(69)
470	CALL CLEAR	(209)
440	DISPLAY TAB(8);*	MEH "FC¢
::	111111	(17)
440	FOR @=1 TO 20	〈97 〉
500	F\$=F\$&_\$	(205)
510	NEXT @	(214)
520	FF\$=F\$	(216)
53 0	60SUB 740	(54)
54 0	605UB 1400	(195)
550	QP=50	(140)
54 0	EDSUB 1340	(165)
570	COOM 820	(145)
	LETT	FAGE

410 DISPLAY TAB(8):LC6: : :

500 605UB 1090	(150)	1010 DISPLAY : "OLD NAME/REM	a a constant of the constant o	1760 DISPLAY "PGM. LOCATED":
590 60SUB 800	(115)	";I+1;P6\$(I):: (200)	**** ** ** ** ***	: :P6\$(I-1): : :"DO NOT REN
600 60SUB 1260	(64)	1020 INPUT " 1	, , , , , , , , , , , , , , , , , , , ,	IND !": : :"ENTER OLD OR SAV
610 E0TO 310	(134)	111111111111	1390 6ØSUB 990 <49>	E CS1": ::"CON TO CONTINUE"
620 CALL CLEAR	(209)	:N\$ (131)		(18)
630 DISPLAY TAB(B);		1030 IF LEN(N\$)>12 THEN 1040	1410 IF SE6*(P6*(I),2,1)="_"	1765 REM Change 1770 to RUM
AC\$: : : : : : :		ELSE 1070 (46)		"CS1" for extended basic aut
640 60SUB 1900	(195)	1040 CALL CLEAR (209)		oload (165)
650 GDSUB 830	(145)	1050 DISPLAY "REDU !" (218)	1430 IF (L\$="N")+(QP=50)+(QP	1770 BREAK (142)
660 60SUB 1090	(150)	1060 60T0 1020 (78)	=51)THEN 1460 (220)	1780 60TO 310 (134)
670 GDSUB 1360	(165)	1070 FS\$=N\$\$SEG\$(_\$,1,12-LEN	1440 I=I+1 <11>	1790 INPUT "NUM 1-10 OR ""0"
680 505UB 800	(115)	(N\$)) (112)	1450 IF 1>19 THEN 660 (208)	* TO EXIT ":C <202>
690 GDSUB 1260	(64)	1080 RETURN (136)	1460 IF (L\$="Y")+(OP=52)THEN	1B10 IF (C(0)+(C)13)THEN 180
700 GOTO 310	(134)	1090 INPUT "CHANGE? Y/N ":CH		0 (211)
		\$ (196)		1820 M=C-1 (10)
710 CALL CLEAR	(209)	1100 IF CH\$<>*Y" THEN 1250	1480 F\$=F\$&SEG\$(FF\$,LF+1,240	1830 RETURN (136)
720 DISPLAY "@1983,	•	(50)		1840 CALL CLEAR (209)
85*	(20)	1105 OP=51 (141)	1,007	1830 FOR R=1 TO MI (221)
730 STOP	(152)	1110 DISPLAY (162)		1860 READ A\$ (252)
740 CALL CLEAR	(209)	1120 INPUT "NUMBER OF REMARK		1870 DISPLAY TAB(3); A\$ (32)
750 FOR I=0 TO 19	(113)	0 FOR NONE ":I		1980 NEXT R (232)
760 P6\$(I)=SEG\$(F\$,	1\$12+1,12	(5)	1490 RETURN <136> 1500 INPUT "LOCATION 1-10 ":	1890 RETURN (134)
1	(101)	1130 IF (I)10)*(I(21)THEN 11		1900 CALL SOUND (T, 111, 30)
770 IF (SEG\$(PG\$(I)	1,1,1}=" "		N (193)	(165)
) * (SE6*(P6*(I),1,1)	="")THEN	90 FLSF 1150 (121)		1910 CALL SBUND(1,111,30)
790	(252)	1140 DISPLAY (162)		(75)
780 NEXT I	(223)	1150 INPUT "NUMBER OF PROGRA		
790 RETURN	⟨13&⟩	M 0 TO QUIT ":I	1540 CALL COLOR(CC,1,1)	
BOO INPUT "PRINTOU"	? 1=Y/0=N	(9)	·- ··	1930 DATA 11111111111111111
*:10	(76)	1160 IF I=0 THEN 1250 (227)		11111,1
810 IF 10=0 THEN 83		1180 IF 1>20 THEN 1250 (24)		t,t OPTION LIST t
820 OPEN #10: "PIO"	(155)	1190 I=I-I (12)		, *
830 CALL CLEAR	(209)	1200 SOSUB 990 (49)		(45)
840 PRINT #IO:TAB(1210 P6\$(I)=FS\$ (236)	1590 GOSUB 1840 (135)	1940 DATA ************
4);"NUM ";TAB(12);"		1220 DISPLAY (162)	1600 CALL SCREEN(15) <200>	11111,1
try that: y televiterit	⟨78⟩	1230 INPUT "MORE Y/N ":CH\$	1610 CALL KEY(0, KE, ST) (84)	*, * 1. SEARCH *
850 FOR I=0 TO 19	(113)	(15)	1615 IF ST=0 THEN 1610 (171)	,\$ 2. NEW \$
860 IF 1709 THEN 97		1240 IF CH\$="Y" THEN 1120	1620 CALL HCHAR(18,1,31,192)	⟨23⟩
870 IF 1>08 THEN 90		(239)		1950 DATA # 3. CHANGE
880 PRINT #10:TAB		1245 GOSUB 1360 (165)		1,1 4. PRINT
*;P6\$(T)	(9 8)	1250 RETURN (136)		*,
•	(244)	1260 INPUT "SAVE Y/N ":AN\$	OUTPUT, FIXED 192 (240)	(180)
890 60TO 930		(15)		1960 DATA \$
900 PRINT #10:TAB		1270 IF AN\$<>"Y" THEN 310	1660 IF ICH THEN 1680 (168)	1,1
";P6\$(I):TAB(12);"		(135)	16/0 CALL SUREEN(11) (196)	*,** ENTER 1,2,3,4 OR 5
040 0070 070	(72)	1280 OPEN #4: "CS1", INTERNAL,	16B0 PRINT #2:I (146)	- 1 *, 1
910 GDTO 930	(244)	OUTPUT, FIXED 192 (69)		⟨61⟩
920 PRINT #ID:TAB		1290 PRINT #4:64 (182)		1970 DATA *************
";P6\$(I)	(24)	1272 PRINT #4:H\$ (183)		***** ,, (201)
930 NEXT 1	⟨223⟩			1980 DATA ,first beep rewind
950 IF 10=0 THEN 9		1300 CLOSE #4 (154)	1720 CALL CLEAR (209)	tape, then push enter!,,,se
960 CLOSE #10	⟨53⟩	1310 RETURN (136)		cond beep push fast fwd,!the
970 IQ=0	〈79 〉	1320 OPEN #3:"CS1", INTERNAL,	1740 CALL COLOR(CC,2,1)	
980 RETURN	(136)	INPUT ,FIXED 192 (223)	.==:	n enter!,, (115)
990 CALL CLEAR	(209)	1330 INPUT #3:6\$ (171)		1990 DATA third beep push st
1000 DISPLAY :" TO		1332 INPUT #3:H\$ (172)		op, then enterly,,,,,,,pres
06 PRESS ENTER.":		1334 F\$=6\$&H\$ (183)		s any key to continue. <163>
OR LUCAS CHIEF.		STAN CLARE AT /SETS		
	R** (105)	1340 CLOSE #3 (153)		
NAME "LIMIT 12 CH	R** (105)	1340 CLUSE #3 (133) 1350 RETURN (134) 1360 F\$="" (239)		**DONE **

FUNNELMED V4.13 in both 40 and 80 columns new features report by Charles Good Lima Ohio User Group

In 40 column mode changes on FWB between v4.12 and v4.13 are small and mostly transparent. An incompatibility was discovered between Horizon Ramdisks and Myarc disk controllers which caused FWB to act up now and then. This has been fixed. Unless you use both these pieces of hardware you may not notice any difference between v4.12 and v4.13. Other differences include paging of directories from BD or from SD with E/X as well as with N/B. The format of the P(rint)ed Directory has been improved.

The big changes are in the optional 80 column editor ED/EE files. This 80 column FWB editor has been revised from the original test release and now works properly with YI, CorComp, and Myarc disk controlles. The 80 column editor was written specifically for use with the DIJIT APVC card and as of this date (Jan 18, 89) it is still not known if the editor works with the Geneve in GPL mode or with the Mechatronics 80 column peripheral, both of which use the same video chip as the AVPC card. All features of the FWB v4.13 40 column editor and its relation to the rest of FWB are retained in the 00 column editor.

Significant new features of the 80 column editor include V(iew) file in 80 columns after invoking SD, and a really slick 80 column SD display showing 20 files at a time. Both the work file name (if you have previously used LF, SF, or PF) and the name of the most recently marked file are displayed. You can also unprotect or protect the marked file, something not possible with SD from the 40 column editor.

Both the 80 column editing and the SD screens are in four colors. You can change the background and text colors of the tab ruler at the bottom of the editing screen, together with its cursor column position indicator, separately from the main background and text colors. These separate colors are also used in the three data display areas within the SD screen. Upon first booting the editor, the two additional colors are the second set of colors receipured into FWB using FWB's CF/C5 configuration files.

Minor new features include Ctrl/Y acting as BOTH left and right margin release, the ability to switch from normal scan (usually best) to interlace scan (may be useful with 80 column monitors that have very fast fade phosphors), and the ability to switch from NTSC (used in N. and S. America) and PAL (used in much of the rest of the world) scan standards.

User groups (not individuals) can obtain a copy of FMB 4.13 (with 40 column editor) and its additional 30 column editor files by sending a disk and paid return mailer to the Lima User Group, P.D. Box 547, Venedocia OH 45894. Please specify in your request if you want the extra 80 column editor files. Remember, the 80 column editor works only with special hardware. We are interested in knowing if this 80 column editor works with the Geneve and the Mechatronic card.

**DONE **

A DUB IN THE DM:000 THAT COMES WITH FUMMELNES V4.1x reported by Charles Sood

 $ilde{I}^{\prime}$ **Due** to a bug, the DM1000 of FWB 4.1x SDMETIMES fails to properly copy disks sector by sector when you select COPY DISK from DM1000's Disk Utilities submenu. Problems occur if you attempt to copy a disk with a capacity greater than SSSD ento an uninitialized target disk. DM1000 is supposed to sense that the target disk is uninitialized, and if it is then DM1000 is supposed to sense the format of the priminal disk and initialize the target disk accordingly. What actually happens is that the target disk is ALWAYS initialized as SSSD irrespective of the format of the original disk. After sector 350 you get a continuous series of write errors. No problems occur if you use COPY DISK to sector copy a SSSD 360 sector original. Also, no problems occur with EOPY DISK if the target disk is already properly initialized in the correct format. New blank disks can be initialized with INITIALIZE or BOX FORMAT using FWB's DM1000 with no problem, and disks can be copied file by file using FWD's DM1000 with no problem. The bug only shows up in the specicific situation described above. This bug is found in all versions of FWB 4.1% that I have seen, including the recently released v4.13.

**DONE::

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DESTIONS ABOUT DIJIT'S AVEC CARD by BIJII SYSTEMS, 3540 Atlans Ave Samblego EA 72116, 619-281-2647

DITOR'S NOTE: The following text file was prepared by DIJIT systmes to answer common questions about their AVPC card. It should, however, be of interest to all TI computer users as it contains interesting information about Rave 99 keyboards, switching power supplies, and a very interesting theoretical discussion of TV and monitor resolution.

AVPC QUESTIONS AND ANSWERS

The following questions have been asked of us concerning the AVPC and other DIJIT products. Since most of the questions asked tend to be redundant, we have chosen the bulletin board medium as a means of disseminating the information while cutting down on our overwhelming correspondence. If the answer to your question isn't here then please address it to us in the E-Mail section and we'll add it to the list.

WHAT IS THE AVPC?

The DIJIT Systems Advanced Video Processor Card is an advanced accessory for the TI-99/4A. It is installed in the Peripheral Expansion Box and functionally replaces the existing Video Display Processor in the console.

IS THAT ALL THAT'S TO THE INSTALLATION?

No. There is a minor change to be made in the console which effectively puts the existing VDP "to sleep" and allows addressing video functions in the P-Box. No soldering is required.

WHAT TYPE OF MONITOR IS NEEDED FOR THE AVEC?

GBB&P Editor's note: I use a high resolution green exactrome monitor with my AVPC card with no problems at all. The resolution is more than adequate for 80 column text work. You can see every pixel of every letter, even in 80 columns. I paid \$75 for the monitor and \$20 for the cable to hook the monitor to my AVPC card. Color is nice, however, and if you are interested in color read on. The comments about color monitors and TVs in this article apply equally well the the AVPC card, the Seneve computer, and the Mechatronics 80 column peripheral.)

It is strongly recommended that an 80 column rated Analog RGB monitor be used. Only such a monitor can legibly display 80 column text as well as present the S12 colors and advanced graphics functions the AVPC is capable of generating. See our text file "Monitors" for what's available on the market today.

CAN I USE A COMPOSITE MONITOR WITH THE AVPC?

We do NOT recommend it. A composite monitor doesn't have the video bandwidth nor a picture tube fine enough to display 80 column text. We did make a provision to drive a composite video monitor with the AVPC. However we had a monochrome monitor in mind not a color monitor. Frankly, the color display is terrible, not even Yamaha uses the composite video

output of the V993B in their own MSX II computer where the composite video signal is derived external to the V993B from the R, G and B signals.

MOW ABOUT A TY?

Definately no. A TV is even worse than a composite monitor.

WELL THEN CAN I USE THE ITL TYPE RGB MONITOR THAT IS USED WITH THE IBM-PC?

Mn. The TYL RGB monitor requires 5 volts of digital video data to drive it and it can only display 16 saturated colors. The AVPC generates 1 volt of analog video and up to 512 colors. They are completely incompatible.

WHAT SHOULD I LOOK FOR IN AN SO COLUMN RGB MONITOR?

There are two major factors affecting the resolution of a momitor, the bandwidth of the video amplifiers and the coarseness of the phosphor dots on the display screen.

Most TV sets can adequately display 40 column text and have a video bandwidth of approximately 3 to 4 Mz. But, if you really examine the text displayed, you will find that the characters have a very "soft" appearance, that is, the edges of the characters are not sharp and well defined like those on a printed page. This softness is due to the electron beam not switching on and off abruptly. That little bit of time required to switch the electron beam on or off is referred to as "rise time". In the ideal world this time would be zero, but in the real world even the fastest events in nature take a certain amount of time. The closer we can approach the ideal, the shorter the on - off time, the crisper the edges of the characters displayed.

It can be shown mathematically that "rise time" and bandwidth are inversely related. That is, as the rise time approaches zero, the bandwidth of the video amplifiers required approaches infinity. We can rigorously calculate the characteristics of the video amplifier required by Fourier analysis, however for a quick estimate we can use a "rule of thumb":

BW(MHz) ~ 500 / Tr (nsec)

The formula states that the amplifier bandwidth in Megahertz is approximately equal to 500 divided by the rise time of the pixel in nanoseconds.

Typical Tr for the TMS9918A, TMS9928A, TMS9929A is **50 ns. So the** video amplifier bandwidth required is approximately 10 MHz. The V9938 requirement is similar.

The other major factor determining resolution of a monitor is the screen of the cathode ray tube on which the data is displayed. There is generally no problem with a monochrome screen, be it amber, green or white. But the screen of an RGB display is consists of tiny dots of red, green and blue phosphors which are lit in various combinations and intensities. The glow is blended by the eye to give the appearance of the various colors of the spectrum.

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The size of these dots in relation to the size of the screen determines the resolution of the CRY. Two common CRY sizes used in computer monitors are 12" (320 mm) and 14" (370 mm). These measurements are taken across the outside diagonal of the tube. The width of the displayable screen for these tubes is 243 mm and 280 mm respectively.

Many computer systems use 640 pixels horizontally for 80 column display by formatting the characters in an 8 x 8 pixel block. The V9938, however displays 80 columns using 512 pixels by formatting the characters in a 7H x 8V pattern. The 512 is exactly double the 256 used by the TI VDP for 40 column display and does not include an allowance for "backdrop" or overscan on either side of the computer generated image. Add approximately 90 pixels for backdrop for a total of 602 pixels displayed.

If we divide 370 mm by 602, we get a dot pitch of .6 mm which is the minimum spacing between adjacent pixels to display the 80 column text. Since the average IV picture tube has a dot pitch of .6 mm, it sounds great. However, having just enough pixels to light as there are generated by the computer or TV only works on those huge TV screens used in stadiums or other outdoor displays. It doesn't work with a CRT, especially if you sit very close to it and stare at it for an extended period of time.

You need about 25% more physical pixels on the face of the CRT to eliminate undesirable things like the "moire effect", the pattern we're most familiar with when we look through two window screens, one behind the other. This occurs because the computer generated image is never in perfect registration with the phosphor dots on the screen. On • 14" CRT, it's been found that .5 mm dot pitch makes for a marginal 80 column display. We recommend .42 mm dot pitch for comfortable viewing. Of course .31 mm is much better, but then the price is also much higher.

There you have it then, a 10 MHz minimum video bandwidth and a .42 mm maximum dot pitch are required for a comfortable RGB monitor. We recommend the Magnavox 8CM515. Which has these characteristics, as the best value.

WE'VE HAD A NUMBER OF QUESTIONS CONCERNING MONITORS AND TVS FROM DUR FRIENDS OVERSEAS WHICH I WILL TRY TO CLARIFY.

First of all I'd like to say that everything above relating to composite video monitors and TVs still applies. The AVCC uses the Yamaha V9938 video display processor designed for use in the MSX II computer. (BB&P Editor's note: The Geneve computer and the Mechatronics 80 column peripheral use the same video chip.) There have been very few MSX computers sold in North America. That computer system is sold almost exclusively outside of the United States.

In North America the the electric utility power system (mains) is 60 Hz and 115 volts while most overseas countries have standardized on 50 Hz and 220 volts. The TI-99/4A will accompodate either power (mains) standard.

It has been determined in the early day of television that the vertical scan frequency of video display devices should be directly related to the power (mains) frequency in order to reduce the effect of external electrically caused noise and interference on the video. Thus the noise

interference tends to be stationary on the screen instead of annoyingly moving up or down.

To accommodate the different vertical scans, TI provided two different VDPs for the TI-99/4A, the TMS 9919A for domestic use and the TMS 9929A for use in countries with 50 Hz mains frequency. The Yamaha V993B accommodates the 50 Hz and 60 Hz vertical scan frequencies through software, a much more elegant solution.

The video horizontal scan frequency of the V9938 is 15750 Hz, while NTSC is 15734 Hz and PAL is 15625 Hz. Most R68 monitors should have no problem locking on although the horizontal frequency adjust may have to be "tweeked" a little to center the picture.

CAN WE PROVIDE CABLES WITH THE SCART CONNECTION?

SCART is an acronym for Syndicat des Constructeurs d'Appareils Radiore'cepteurs et Te'le'viseurs, the French radio and TV manufacturers association. They devised a connection system by which a TV could be used to display peripheral equipment such as VCRs, video disk players, games, etc., including personal computers. The standard makes use of a special 21 pin connector known in France as a "peri" connector and in England as a SCART connector. The pinout and signal levels are also specified. The SCART standard has not been adopted here in the United States and the connectors are almost impossible to obtain although if the quantities justified it, they could be imported. PLEASE NOTE: As far as we know, the SCART standard covers only the connector type, signals and signal levels. It says nothing about screen concerning resolution or video bandwidths. Therefore, just because a monitor has a SCART connector doesn't mean that it is an 80 column monitor.

MON WILL THE AVPC DISPLAY MY EXISTING PROGRAMS?

The AVPC will display most popular TI-99/4A programs as usual, but much clearer when they are displayed on a high resolution RGD menitor.

IS THE AVPC COMPATIBLE WITH ALL EXISTING TI-99/4A

The AVPC is compatible with most popular programs, however it is less tolerant of poorly written software than the unmodified TI-99/4A. (BB&P Editor's note: A review of the APVC to be published in the March 89 issue of BB&P will include a short list of software that doesn't work properly with the AVPC.)

WILL EXISTING PROGRAMS BE DISPLAYED IN 80 COLUMN NODE?

No. Existing programs are displayed exactly the same way as they are on the TI-99/4A. The enhanced features of the AVPC require specific application programs to invoke them. (BBAP Editor note: See the description of Funnelweb v4.13 in 80 columns published elsewhere in this newsletter.)

CAN I ACCESS THE ABVANCES FEATURES OF THE AVPC THROUGH EXTENDED BASIC?

You can access some of the features such as the mouse, with drivers written by Dodd and Hoddie, also some of the graphics features with routines such as those written by Jeff Kittka. See our X-Modem download section. As other drivers become available we will post them on our BBS.

MON ELSE CAN I ACCESS THE ADVANCED FEATURES OF THE AVPC?

The advanced features of the AVPC are accessed through specific application programs such as the 80 column TI-Writer editor, 80 column Multiplan etc. All the features of the card are accessible through FORTH and C as well as Assembly Language. (DIJIT Systems will have a programmers guide for sale to people who wish to program in the latter lower level languages). We have found that many of the early programs written for Myarc 9640 under SPL, especially graphics, will also run on the AVPC.

IS THE AVPC COMPATIBLE WITH OTHER THIRD PARTY PERIPHERALS?

The AVPC was designed to work with and be compatible with Texas Instruments TI-99/4A peripherals. Hardware and software not conforming to Texas Instruments hardware and software specifications may not work with the AVPC.

WHAT IS A "QI" CONSOLE?

(BBAP Editor's note: DIJIT Systems specifically states in promotional material that their APVC card is not compatible with "Ol" consoles. However, use of the below mentioned "switching power supply", which is a feature of "Q1" commoles, does not by itself render a commole incompatible with the APVC. I have retrofitted a "switching power supply" from Radio Shack to the console I use with my AVPC card with no problems.) "QI" stands for Quality Improvement and was the designation given the last production model of the II-99/44. before Texas Instruments went out of the home competer business. Internally, it had a newly designed PC board on which a large gate array consolidated the logic functions performed by discrete "glue chips". Another feature was an improved switching power supply made by an offshore contractor. The latter were surplused out to Radio Shack and others and had the contractor's name "IRIICHI TSUSHIN KOGYE CO., LTD." on them. Externally, the "DI" is a beige compole recognized by looking at the side accessory port. The shielding "finger stock" is silver colored, all non-"Q1" consoles have gold or brass colored "finger stock". We cannot endorse the "GI" consoles for use with the AVPC because they are a rarity and we have not tested them. Besides, there are plenty of standard comsoles on the used sarket and we know they will work.

15 THE AVEC COMPATIBLE WITH THE HORIZON RAMDISK?
Yes, there was an incompatibility between the AVPC and
the Marizon Ramdisk. The AVPC, being the new kid in the
meighborhood has received some "heat" for incompatibility.

The Trade Union argument that "the last card in the box has

the lamest seniority" and so should take the "heat", we found unacceptable in this case. We knew the AVPC was compatible with, II, CorComp and Myarc disk controllers and had no problems when saving Text2 (80 column) files or other advanced files to floppy disk. If you couldn't save them to the MRD, then clearly the Ramdisk was not emulating a standard floppy disk drive. The problem was in the MRD sperating System or ROS. Barry Boone came to our rescue by writing a ROS "patch" for HRD owners who also have V938 based video systems. BARRY'S ROS PATCH really consists of two different programs, one for the TI and CorComp disk controllers and the other for the Myarc disk controller. Both are "Fairware" and are included in the download section of the bulletin board under the title: "Horizon ROS".

I HAVE A RAVE KEYBOARD, WHY CAN'T I GET THE AVPC TO GUIT WITH "IFCTN] ="?

Incorporated in the power up routine of the AVPC is a little feature to eliminate the bane of the BASIC programmer. Namely, to have keyed in a long program and requiring a "+" sign, to have your finger slip from the ESHIFIJ key to the IFCTNJ key and watching your work disappear. Now you have to make an effort to QUII, you must use two hands and press IFCTNJ, ICTRLJ and "=". The RAVE keyboard only scans two keys at a time and so it can't sense our three key QUII feature. However RAVE does sell a cable assembly for their keyboard which works like the reset button on the "Widget" and accomplishes the same thing.

MMY DON'T SOME OF THE "FAST-TERM 80" FUNCTIONS WORK WITH THE MYPC?

"Fast-Term 80" started out being an experimental varsion of Fast-Term called "Fast-Term 9640" by Paul Charlton. According to the documentation, he admits that it was a trial version. It was made usable on the AVPC through the prodigious efforts of some local programmers working without source code and not asking for remuneration. If it has flaws, sorry about that, maybe Paul Charlton will fix them if he has enough requests.

DOES TELCO WORK IN BO COLUMNS ON THE AVPC?

Yes. Charles Earl, the author of TELCO, has or had in his possession an AVPC via Bob Boone of the Ottawa Users Group. TELCO Version 2.1 was released to take advantage of the new BO column capability of the TI-99/4A. In general the program works beautifully although there are a couple of minor flaws that we're sure will be taken care of, in time. TELCO is a complex program and was written in modules or everlays so that it could be accompodated with the limited amongy available in the TI-99/4A. The basic 99/4A ran only hold 3 of these overlay modules in memory at a time and so as a new function is requested the program must go out to the disk and retrieve that overlay. Mr. Earl has ingeniously taken advantage of all the video memory available with the AVPC and stored 27 overlays in it. In effect it acts as a "AMMOISK". And so the execution of TELCO with the AVPC is

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substantially factor than on the basic TI-99/4A. TELCO Vargion 2.2 is now in the X-NODEM download section of the DIJIT systems BBS.

DOES THE AVPC HAVE PROBLEMS WITH SOME TERMINAL PROGRAMS?

The AVPC had problems with interrupt driven terminal programs such as TE II, Fast-Term, Hass Transfer etc. Non interrupt driven programs such as OMEGA work fine. After a month of self doubt, we discovered the problem wasn't our doing after all, but that there was a "bug" in the RS-232 card. See below. If the EPROM in the RS-232 card in replaced, the AVPC works with all terminal programs that we are aware of.

WHY DOES THE AVPC HAVE PROBLEMS WITH THE RS-232 CARD?

The AVPC was designed to work within the hardware and software constraints of the TI-99/4A. To do so required sharing the external interrupt bus between the P-Box and the camsale. This incidently, is one of the major differences between the AVPC and the Mechatronics 80 Column Card. The RS-232 cord was the only card made by TI or third party vendors that made use of this external interrupt bus until the AVPC came along. There is a "bug" in the TI Interrupt Sorvice Routine that causes the card to shut down when an interrupt is sensed but there is no data in the incoming buffer. CorComp and Myarc copied the ISR and the "bug" with the same results. If TI stayed in business and had brought out any more interrupt driven peripheral cards, they would have had to contend with the ISR "bug". DIJIT sells code correction EPROMs for the TI, CorComp and Myarc RS-232 cards.

WAT IS "FAST VIDEO RAM"?

The AVPC was designed not just to display computer text and graphics on the screen, but to work with "real time video frace grabbers" and other digitizers. For this reason Yamaha recembended the more expensive 120 nanosecond fast video hamm. Some brands of 150 nanc RAMs will work just fine. Namever we found that some, notably the II 4464-15 does not work.

CAM I USE THE AVPC'S EXTRA RAM FOR OTHER PROGRAMS?

(BB&P Editor's note: The AVPC card usually comes with 128K of VDP ram and has sockets for an additional 64K of VDP ram. This replaces the 16K VDP ram that comes with the comsole. This extra video ram is partly why the AVPC card can display up to 512 colors and can easily show text in 80 columns.) The CPU cannot directly access the AVPC's RAM and so cannot run programs out of it. Video RAM can be used as a buffer to store data, however. As explained above, TELCO does just that and stores its modules or overlays in video RAM, in effect making it work as a RAMDISK. Access to video RAM for data storage can only be had through Assembler or wher low level languages.

WHAT IS GENLOCK?

The term "genlocking" is a contraction of "general locking" and refers to the complete synchronization of a

video, accessory with an external video source. Sanlocking is required in order to do superpositioning of graphics or other video, on the source video also for digitizing. In a TV studio, all cameras and special effects devices are synchronized by a standard clock signal that is distributed throughout the studio. However when such a standard signal is not available, it is necessary to derive the synchronizing information from the source video by means of a genlocking device. The name "Genlock" has been applied by Amiga to an accessory capable of superpositioning or overlaying computer graphics and text onto externally supplied video.

WHAT IS A 'REAL TIME FRAME GRABBER'?

It is a video digitizer that can capture a video image as fact as it is presented. Some video digitizers in use today, motably on the Amiga, cannot capture live video. They work by slowly scaning a picture in monochrome through color separation filters and storing it in memory where it may be emipulated for the purpose of screen display or dumping to a erister. A television image consists of 2 'fields' interlaced together to form a complete picture called a 'frame' which is equivalent one picture of a movie film. Each field requires 1/60 of a second, the total frame them takes 1/30 of a second to display. I countries using the PAL standard, a field requires 1/50 of a second and a frame is 1/25 of a second. Our DIJIT-EYE-ZER will be capable of capturing either a field or a frame in 'real time'. as quickly as it is displayed. And we will be able to do it in 256 colors in medium resolution mode. (BB&P Editor's note: The BIJIT-EYE-ZER will be demonstrated Feb 18-19 at the TI-FEST WEST 89 in San Diego CA.)

DOES THE AVPC WORK WITH THE BUD MILLS 32K CONSOLE MEMORY EXPONDION KIT?

the have not had any complaints on that from our customers. Barry Boone claims to have no problems with it and his Mechatronics card. We will maintain a conservative mariness on this one because it gets its speed increase by eliminating the 'wait states' that II had built in to assure timing compatibility with peripherals.

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