VZ 200/300

HUNTER VALLEY
VZ JOURNAL

A VERY MERRY CHRISTMAS AND PROSPEROUS AND HAPPY NEW YEAR 1991

     'LOAD UP' IN ISSUE 28/13 BY BOB KITCH WAS INADVERTANTLY CORRUPTED BY ME WHILE
TRYING TO FIT PROGRAM ON SINGLE PAGE. A SOLUTION IS PRESENTED AND MY APOLOGIES TO
ALL.

     A USEFULL LITTLE ROUTINE FOR PEEKING AROUND MEMORY, BASIC OR DOS ROMS, ETC.
SOME MEMORY ADDRESSES ARE GIVEN FOR YOUR PERUSAL.

     BOB CONTINUES ON FROM LAST ISSUE FINISHING HIS EXPLANATION OF VZ GRAPHICS AND
LIFTING THE VEIL OF MYSTERY FOR MANY OF US.

     AS BOB MENTIONS IN HIS ARTICLE NOT MANY PROGRAMMERS USE SOUND EFFECTIVELY ON
THE VZ.   BOB PROVIDES A SIMPLE DEMO PROGRAM CALLED 'STARWARS' WITH MORE COMPLEX
SOUNDS TO FOLLOW.

     ANOTHER OF BRIAN GREEVE'S PROGRAMS I MANAGED TO CORRUPT IN ISSUE 28/6-7.
AGAIN IT WAS THE MACHINE CODE WHICH HAD WRONG ADDRESSES. THE CORRECTED VERSION IS
REPRODUCED. MY APOLOGIES AGAIN TO ALL.

     BEN CONTINUES WITH LARGER ROUTINES FOR YOU TO TRY OUT YOUR SKILLS AT ASSEMBLY
PROGRAMMING.

     THOSE WHO WISH TO MODIFY THEIR DSE DISK BASED DATABASE NEED LOOK NO FURTHER AS
JOHN PROVIDES THEM INFO ON HOW TO ACCOMPLISH IT.

     I'M PLANNING MASSIVE MEMORY EXPANSION FOR THE VZ. I'VE EXPANDED THE VZ MEMORY
MAP TO SHOW YOU WHAT I PROPOSE AND WHAT I/O PORTS I INTEND TO USE. FOR THOSE
INTERESTED PLEASE CONTACT ME AS SOON AS YOU CAN.

BELIEVE IT OR NOT :
     THERE WAS THIS PERSON WHO SHALL REMAIN NAMELESS WAS REQUESTED BY THE PROGRAM
HE WAS USING TO 'PRESS ANY KEY TO PROCEED' WHICH HE COULDN'T FIND, SO HE TOOK HIS
COMPUTER BACK TO THE SHOP FOR ONE WITH AN 'ANY' KEY.

CONGRATULATIONS: ON THE PRODUCTION OF THE FOURTH
ANNIVERSARY EDITION. I PERSONALLY ACKNOWLEDGE THIS IS DUE MOSTLY TO YOUR EFFORTS. BRIAN GREEVE.

THANKS BRIAN FOR YOUR WORDS OF PRAISE WHICH IS GREATLY APPRECIATED, BUT ANY PUBLICATION IS ONLY AS GOOD AS ITS COTRIBUTORS. I WAS LUCKY IN HAVING THE SUPPORT OF HIGH CALIBRE CONTRIBUTORS LIKE YOURSELF AND MANY OTHERS AS WELL. JOE LEON , EDITOR.

FOURTH ANNIVERSARY: WHEN I FIRST STEPPED IN DECEMBER
1986 I NEVER ENVISAGED THAT I'LD BE STILL EDITING FOUR YEARS LATER. FROM THE FIRST TO THE CURRENT ISSUE I'VE TRIED TO PRODUCE THE JOURNAL TO THE BEST OF MY ABILITIES AND I FIND THAT EVEN AFTER ALL THIS TIME AS EDITOR I STILL ENJOY DOING IT.

IN THE LAST 12 MONTHS I NEARLY GAVE IT ALL UP SEVERAL TIMES FOR PERSONAL REASONS, BUT THINGS ARE STARTING TO LOOK UP AND WOULD YOU BELIEVE TWO ISSUES IN TWO MONTHS. LOOKS LIKE I'LL BE ABLE TO CATCH UP SOON. LIKE ANYONE ELSE I MAKE MISTAKES AND THERE HAVE BEEN A FEW LATELY AND I FIND I'M LEARNING BECAUSE OF THEM.

THE JOURNAL HAS GIVEN ME A GREAT DEAL OF PERSONAL SATISFACTION, SELF ESTEEM AND A SENSE OF ACCOMPLISMENT, BUT MOST IMPORTANT OF ALL ONE WAY OR ANOTHER I'VE MADE CONTACT WITH MANY PERSONS VIA THE POST, PHONE OR PERSONALLY AND SHARED A COMMON INTEREST, THE MIGHTY VZ.

HELP WITH ARTICLES: I'M RUNNING SHORT OF ARTICLES
AGAIN FOR THE JOURNAL SO IF YOU CAN HELP OUT HOWEVER SMALL YOUR CONTRIBUTION IT WOULD BE APPRECIATED. REMEMBER THIS IS YOUR JOURNAL AND AS THE SAYING GOES MANY HANDS MAKE LIGHT WORK AND IT WOULD MAKE MY JOB LOTS EASIER. SO SHARPEN YOUR FINGERS AND START TYPING AWAY.

OPEN INVITATION: OUR CLUB DOORS ARE OPEN TO ALL
VISITORS REGARDLESS OF GEOGRAPHY. SO IF YOU ARE PASSING THROUGH OR HOLIDAYING NEARBY, THEN GIVE US A CALL EVEN IF IT'S NOT CLUB MEETING TIME. WE'LL BE GLAD TO SEE YOU.

WANTED: A CHEAP BUT OK 64K RAM PACK.
PHOTOCOPIES OF: AEM ARTICLES ON VZ, EG: APRIL 88. EA JULY 81, GP-100 REVIEW AND VZ. ETI MARCH 84 STEVE OLNEY ON THE VZ. ETI-687 VZ200 34K SUPER DUPER VZ. ETI OCT 84 RITTY. JULY 85 AND ANY OTHER ARTICLES UP TO JUNE 88 (ON VZ).

DAVID MAUNDER 'LYNDONDALE' BORAH CREEK ROAD QUIRINDI 2343
PHONE: (067) 461 711 AFTER 4 PM.

WANTED TO SWAP: VZ 300 PCB (NO CASE OR KEYBOARD),
JOYSTICK INTERFACE WITH ONE JOYSTICK; 9 X 6116 2K RAM CHIPS, Z80A, 2716 EPROM, 2 X 482764 EPROMS, PLUS VARIOUS IC'S LIKE 74LS138, 74LS157. ALL CHIPS ARE FROM A DEFUNCT MICROBEE AND ARE SOLDERED EXEPT FOR THE Z80A AND THE EPROMS. THE VZ 300 ONLY NEEDS A U14 IC (GA004).

SWAP FOR: VZ 200 IN WORKING CODITION WITH OR WITHOUT KEYBOARD.
IF THIS DEAL DOES NOT PLEASE THEN CONTACT ME ANYWAY AS I HAVE OTHER GOODIES THAT I WILL THROW IN TO COMPLETE THE DEAL.

BEN HOBSON PO BOX 255 QUIRINDI 2343 - PHONE: (067) 462 076)

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THE PROGRAM WILL NOT LOAD ANY HI-RES SCREENS INTO MEMORY AND MORE LIKELY WILL HANG UP. WHEN EDITING I SHORTENED THE START OF THE PROGRAM SO IT WOULD FIT ON ONE PAGE. EVEN THOUGH THE WARNING WAS IN LINE 1020 SOMEHOW I MISSED IT. MY APOLOGIES TO BOB AND OUR READERS. TO MAKE UP FOR IT I PRESENT A SOLUTION SO YOU CAN FIX IT UP.

LOAD LOAD UP AND TYPE IN THE LITTLE PROGRAM BELOW AND THEN SAVE THE ALTERED PROGRAM. NEXT TYPE IN GOTO 4000 AND PRESS RETURN. WHAT WE'LL BE TRYING TO DO IS TO FIND OUT THE POKE ADDRESSES FOR THE LETTER A AND H IN THE CHARACTERS 'ABCDEFGH' IN LINE 1000. YOU'LL SEE THREE COLUMNS ON THE SCREEN.

FIRST COLUMN = MEMORY ADDRESS OF THE CHARACTER.
SECOND COLUMN = ASCII CODE OF THE CHARACTER.
THIRD COLUMN = CHARACTER.

USING THE SPACE KEY TO START/STOP CONTINUE TILL THE LETTERS ABCDEFGH ARE DISPLAYED ON THE SCREEN IN THE THIRD COLUMN. WRITE DOWN THE ADDRESSES FOR THE LETTERS 'A' AND 'H' AND PRESS 'Q' TO QUIT. NEXT LIST LINE 1000. ENTER THE TWO NEW ADDRESSES OVER THE OLD ONES AND THEN LIST LINE 2100. TYPE IN THE NEW ADDRESS FOR 'A' OVER THE OLD ONE AND THAT COMPLETES THE CORRECTIONS. THE PROGRAM SHOULD WORK AS DESIGNED NOW. ANY TIME YOU ALTER LINES 10 TO 1000 YOU HAVE TO CHANGE THE ADDRESS FOR 'A' IN LINE 2100 USING THE MEMORY PEEK ROUTINE TO FIND THE NEW ADDRESS FOR 'A' FIRST.

```
3090 '
4000 CLS:POKE30777,1:PRINT@3,"SPACE START/STOP   Q-QUIT"
4010 PRINT:FORL=31800 TO 31900
4015 PRINT TAB(9) USING"######  ";L;
4020 PRINT USING" ###   ";PEEK(L);
4030 IF PEEK(L)<32 THEN PRINT:GOTO 4050
4040 PRINT USING"%%";CHR$(PEEK(L))
4050 IF INKEY$=" "THEN 4060 ELSE IF INKEY$="Q"THEN 4070
4060 IF INKEY$=""THEN 4050 ELSE NEXT
4070 CLS:END
```

ENLARGED MEMORY PEEK ROUTINE:

```
100 CLS:POKE30777,1:PRINT" ▮▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ ▮";
110 PRINT@98,"";:INPUT"ENTER START ADDRESS ";SA
120 PRINT@162,"";:INPUT"ENTER  END  ADDRESS ";EA
130 IF EA<=SA THEN 120
140 IF SA>32767 THEN SA=SA-65536
150 IF EA>32767 THEN EA=EA-65536
160 :
170 CLS:POKE30777,1:PRINT"▮▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ ▮";
180 PRINT:FORL= SA TO EA:PRINTTAB(9)USING"######  ";L;
190 PRINT USING"###   ";PEEK(L);
200 IF PEEK(L)<32 THEN PRINT:GOTO 220
210 PRINT USING"%%";CHR$(PEEK(L))
220 IF INKEY$=" "THEN 230 ELSE IF INKEY$="Q"THEN 240
230 IF INKEY$=""THEN 220 ELSE NEXT
240 PRINT@431,"▮▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ ▮";
250 POKE 30777,35:SOUND30,1
260 IF INKEY$=CHR$(13)THEN 100 ELSE 260
270 :
280 'SOME INTERESTING PEEK ADDRESSES
290 'ADDRESSES  270 TO 300  &  5710 TO 6130
300 'ADDRESSES 6420 TO 6460 & 17190 TO 17270
```

WE NOW NEED TO CONSIDER THE TIMING OF THE CPU IN DOING A 2K BLOCK MOVE OPERATION. THE Z80 IN THE VZ300 RUNS AT 3.54 MHZ (THE VZ200 RUNS AT 3.58 MHZ). THE FOLLOWING TABULATION INDICATES THE TIMING OF THE BLOCK MOVE -

OPCODE	T-STATES	M-CYCLES
DI	4	1
LD HL	10	3
LD DE	10	3
LD BC	10	3
LDIR	21x2047+16	5x2047+4
	IF BC=0 THEN T=16 AND M=4	
	IF BC<>0 THEN T=21 AND M=5	
EI	4	1
RET	10	3
	43051	10253

TIME TO EXECUTE IS 43051/3.54E6 SEC. = 12.16 MSEC. TO BLOCK MOVE A 2K SCREEN. THIS IS LONGER THAN THE 7.69 MSEC. MENTIONED ABOVE. A 2K BLOCK MOVE WILL CAUSE HASH TO APPEAR ON THE SCREEN BECAUSE A TIMING CONFLICT IN THE WRITE BY THE Z80 AND THE READ BY THE VDG OCCURS. FOR THOSE OF YOU WHO HAVE SEEN THROWUP OPERATE, YOU WILL HAVE SEEN THIS EFFECT IN THE "PLAIN MODE" OF OPERATION.

SO, WHAT HAVE WE LEARNT THUS FAR ABOUT GRAPHICS ON THE VZ? WE HAVE DISCOVERED HOW THE Z80 AND THE 6847 VDG INTERACT WITH VRAM TO MAKE THE SCREEN DISPLAY. WE HAVE ALSO SEEN WHY "HASH" APPEARS ON THE SCREEN. WE HAVE ALSO ANALYSED THE TIMING OF SCREEN TRANSFERS FROM A BUFFER AND DISCOVERED THAT ABOUT 1K OF DATA CAN BE BLOCK MOVED DURING THE SCREEN REFRESH PERIOD. IN SOME PREVIOUS ARTICLES IN USER GROUP NEWSLETTERS, I HAVE DESCRIBED THE MASKABLE INTERRUPT SYSTEM USED IN THE VZ. LET'S PUT ALL OF THIS TOGETHER TO MAKE A HASH-FREE DISPLAY SYSTEM. SUCH A SYSTEM IS USED IN LIVENUP.

INTERRUPT-DRIVEN SCREEN BUFFER.

I TRUST THAT THE FOREGOING DISCUSSION MAKES IT APPARENT THAT, WHEN WRITING PARTICULARLY GRAPHICS PROGRAMS, IT IS BETTER TO HAVE THE Z80 UPDATING A BUFFER AREA IN MEMORY RATHER THAN DIRECTLY WRITING TO VRAM. THIS IS THE ONLY TECHNIQUE THAT WILL REMOVE THE HASH FROM THE VZ DISPLAY. THIS PROGRAMMING TECHNIQUE HAS THE ADDED ADVANTAGE THAT INTERRUPTS CAN BE DISABLED AND PROCESSING SPED UP CONSIDERABLY BY BYPASSING SOME OF THE VZ'S OVERHEADS SUCH AS KEYBOARD SCANNING.

TO TRANSFER THE BUFFER INTO VRAM EMPLOYS A FEW OTHER PROGRAMMING TRICKS. CLEARLY A 2K HI-RES SCREEN MUST BE MOVED IN TWO HALVES AS THERE IS SIMPLY INSUFFICIENT TIME DURING THE "INVISIBLE" PORTION OF THE DISPLAY UPDATE TO MOVE IT IN A SINGLE 2K BLOCK.

THE METHOD THAT I HAVE USED ENABLES THE MASKABLE INTERRUPTS ON THE Z80 AND RESETS THE INTERRUPT VECTOR TO POINT TO THE SCREEN UPDATE ROUTINES. TO ALLOW SUFFICIENT TIME FOR THE TWO HALVES OF THE BUFFER TO BE RELOCATED, A SUITABLE DELAY OR PAUSE ROUTINE MUST BE ENTERED. ONE SUCH ROUTINE OCCURS IN THE DOS ROM AND CAN BE CONVENIENTLY CALLED WITH THE DELAY DURATION IN MSEC. PASSED IN THE BC REGISTER. IF DOS IS NOT INSTALLED ON THE VZ THEN ANOTHER DELAY ROUTINE OCCURS AT 0060H IN ROM. THE VALUE PASSED IN BC IS NOT IN MSEC. HOWEVER. THE DELAY DURATION VALUE CAN ALSO BE USED TO CONTROL THE SPEED AND SMOOTHNESS AT WHICH GRAPHICS FLOW ACROSS THE SCREEN.

THE SOLUTION - AN ASSEMBLER LISTING.

SO WHAT DOES THE ASSEMBLER LISTING OF ALL OF THIS LOOK LIKE? BY REFERRING TO A LISTING OF MOVE USED BY LIVENUP, SOME CLARITY MAY BE SHED ON THE SUBJECT FOR CONFUSED READERS!

THE LISTING FALLS NATURALLY INTO FOUR SECTIONS. THE FIRST IS THE MAINLINE CALLING SEQUENCE AND IS NOT DETAILED HEREIN AS THIS WILL VARY ACCORDING TO THE APPLICATION. THE SECOND PORTION IS A PAUSE AND DISPLAY SUBROUTINE CALLED DPLY WHICH POINTS THE INTERRUPT VECTOR AT THE MOVE ROUTINES, ENABLES INTERRUPTS AND THEN ENTERS A PAUSE ROUTINE DURING WHICH TIME THE TRANSFER OF THE BUFFER INTO VRAM OCCURS. THE THIRD AND FOURTH PORTIONS MOVE THE TOP AND BOTTOM HALVES OF THE BUFFER RESPECTIVELY. THEY ARE CALLED FROM THE INTERRUPT VECTOR LOCATED AT 787DH DURING THE PAUSE CYCLE AND WHEN INTERRUPTS ARE ENABLED. THEY ARE ACCURATELY TIMED AND INITIATED BY THE *FS SIGNAL WHICH CALLS THE INTERRUPT HANDLING ROUTINE. THE MOVE OCCURS DURING THE "INVISIBLE" PORTION OF THE DISPLAY UPDATE AND ELIMINATES HASH.

```
        MAINLINE OF PROGRAM    ;CALLING SEQUENCE.
        .........
        DI                     ;DISABLE INTERRUPTS TO SPEED UP PROCESSING.
        DO CALCULATIONS ETC.   ;UPDATE VRAM.
        CALL DPLY              ;UPDATE SCREEN DISPLAY.
        EI                     ;ENABLE INTERRUPTS TO RESUME OTHER CHOIRS.
        .........
        END


VRAM EQU 7000H                 ;START OF SCREEN MEMORY.
SSCN EQU 0B200H                ;START OF BUFFER. (OR WHERE-EVER)
SZSC EQU 0800H                 ;SIZE OF SCREEN/BUFFER.
HSZC EQU 0400H                 ;HALF OF SIZE OF SCREEN/BUFFER.
DLAY EQU 4038H                 ;ADDRESS OF DELAY ROUTINE IN DOS.
IVEC EQU 787DH                 ;LOCATION OF 3-BYTE INTERRUPT VECTOR.
JMP  EQU 0C3H                  ;OPCODE FOR JUMP.
TURN EQU 0C9H                  ;OPCODE FOR RETURN.
DURD EQU 22H                   ;DELAY DURATION IN MSEC. TO PERMIT SCREEN UPDATE.


DPLY LD A, JMP                 ;PUT OPCODE FOR JUMP INTO A.
     LD BC, MTOP               ;POINT TO START OF MOVE TOP-HALF OF BUFFER ROUTINE.
     LD (IVEC+1), BC           ;RESET INTERRUPT VECTOR.
     LD (IVEC), A              ;DITTO - NOW POINTS TO MTOP.
     EI                        ;ENABLE INTERRUPTS SO THAT INTERRUPT VECTOR IS SCANNED.
     LD BC, DURD               ;DELAY DURATION IN MSEC.
     CALL DLAY                 ;GO OFF INTO DELAY ROUTINE ALLOWING SUFFICIENT TIME FOR
SCREEN TO BE UPDATED FROM BUFFER.
     DI                        ;DISABLE  INTERRUPTS  TO PREPARE FOR RESUMING MAINLINE
PROGRAM.
     RET                       ;GO BACK TO CALLING MAINLINE TO UPDATE BUFFER.


MTOP LD HL, SSCN               ;SET SOURCE TO START OF BUFFER.
     LD DE, VRAM               ;SET DESTINATION TO START OF SCREEN.
     LD BC, HSZC             . ;SET SIZE TO HALF OF BUFFER/SCREEN SIZE.
     LDIR                      ;UPDATE TOP-HALF OF SCREEN.
     DI                        ;DISABLE INTERRUPTS AS INTERRUPT VECTOR IS TO BE RESET.
     LD BC, MBOT               ;POINT TO START OF MOVE BOTTOM-HALF OF BUFFER ROUTINE.
     LD (IVEC+1), BC           ;RESET INTERRUPT VECTOR.
     EI                        ;ENABLE INTERRUPTS SO THAT DELAY ROUTINE CAN CONTINUE.
     RET                       ;GO BACK TO INTERRUPT HANDLER.


MBOT LD HL, SSCN+HSZC          ;SET SOURCE TO HALF-WAY THROUGH BUFFER.
     LD DE, VRAM+HSZC          ;SET DESTINATION SIMILARLY.
     LD BC, HSZC               ;SET SIZE.
     LDIR                      ;UPDATE BOTTOM-HALF OF SCREEN.
     DI                        ;DISABLE INTERRUPTS AS INTERRUPT VECTOR IS TO BE RESET.
     LD A, TURN                ;PUT OPCODE FOR A RETURN INTO A.
     LD (IVEC), A              ;RESET INTERRUPT VECTOR SO THAT SCREEN UPDATING
ROUTINES ARE NOT ENTERED DURING REMAINDER OF DELAY ROUTINE.
     EI                        ;ENABLE INTERRUPTS SO THAT DELAY ROUTINE CAN CONTINUE.
     RET                       ;GO BACK TO INTERRUPT HANDLER.
```

SOUND OR MUSIC HAS NOT BEEN FEATURED IN MOST VZ SOFTWARE. DURING A NUMBER OF BRIEF ARTICLES, I WILL DISCUSS THE GENERATION OF SOUNDS ON THE VZ. I WILL ALSO PROVIDE SOME THOUGHT PROVOKING PROGRAM LISTINGS. I THOROUGHLY ENJOY COMPUTER GENERATED OR SYNTHESIZED MUSIC. THE VZ CAN ALSO BE USED AS A CONTROLLER IN MUSIC GENERATION.

BACKGROUND

THE VZ TONE GENERATOR USES A SMALL PIEZO SPEAKER CONNECTED ACROSS TWO BITS OF THE I/O LATCH. CLEARLY THERE IS NOT MUCH HARDWARE INVOLVED - WHICH IS WHY ALL THE SOUND GENERATION DEPENDS UPON SOFTWARE.

THE OBVIOUS SHORTCOMINGS OF THIS METHOD ARE TWOFOLD:

FIRSTY, ONLY SINGLE VOICED MELODIES CAN BE PLAYED AND, SECONDLY, NOTHING ELSE CAN BE DONE WHILST PLAYING AS THE Z80 IS FULLY OCCUPIED. TO IMPROVE UPON THIS SITUATION, SOME ADDITIONAL HARDWARE IS REQUIRED, SUCH AS AN ADDITIONAL SOUND GENERATING CHIP.

TONE GENERATION IS A PERIODIC PHENOMENON AND REQUIRES FREQUENT SETTING AND RESETTING OF THE TWO BITS DRIVING THE SPEAKER. THE VZ'S I/O LATCH IS ADDRESSED AT 6800H. BITS 0 AND 5 DRIVE THE SPEAKER IN A PUSH-PULL MODE. THIS MEANS THAT BITS 5 AND 0 MUST BE COMPLIMENTARY TO DRIVE THE SPEAKER. THE SAME LATCH ALSO CONTROLS THE CASSETTE PORT ON THE VZ AND THIS MAY BE USED FOR RECORDING TONES. BITS 1 AND 2 SIMILARLY DRIVE THE CASSETTE PORT.

THE FASTER THAT BITS 0 AND 5 ARE SWITCHED (SET AND RESET), THE HIGHER THE PITCH (OR FREQUENCY) OF THE TONE THAT WILL BE ISSUED FROM THE VZ'S SPEAKER. THE NORMAL AUDIO SPECTRUM EXTENDS FROM 20 TO 20000 HERTZ OR CYCLES PER SECOND. FOR EXAMPLE, THE "MIDDLE C" ON A PIANO IS 262 HZ OR A PERIOD OF 3.8 MILLISEC. (PERIOD IS THE RECIPROCAL OF FREQUENCY)

THE QUALITY OR TIMBRE OF THE SOUND IS QUITE INDEPENDANT OF PITCH OR FREQUENCY. A TRUMPET SOUNDS QUITE DISTINCTIVE TO A TROMBONE BECAUSE OF THE DIFFERENT TIMBRE OF EACH INSTRUMENT. MATHEMATICALLY THIS MAY BE EXPRESSED AS THE PRESENCE OF "HARMONICS" BEING PRESENT ABOVE THE FUNDAMENTAL FREQUENCY. IN TERMS OF SOUND GENERATION, THIS IS CHARACTERIZED BY THE DUTY CYCLE OF THE WAVEFORM. NORMALLY IN THE VZ, THE TWO BITS AT 6800H ARE SWITCHED ON AND OFF AT THE SAME RATE. THIS RESULTS IN A SQUARE WAVE FORM OF OUTPUT THAT IS DEFFICIENT IN HARMONICS. THE DUTY CYCLE IS 50:50. THIS MEANS THAT THE "ON PERIOD" IS OF THE SAME DURATION AS THE "OFF PERIOD". BY VARYING THIS RATIO, SOME INTERESTING SOUNDS CAN BE GENERATED.

A THIRD PARAMETER GOVERNS SOUND. IN ADDITION TO PITCH AND TIMBRE, LOUDNESS PLAYS A PART. UNFORTUNATELY ON THE VZ THIS CANNOT BE VARIED INDEPENDANTLY OF TIMBRE.

VZ SOUND SYNTHESIS.

THE SIMPLEST WAY TO GENERATE SOUND ON THE VZ IS TO USE THE FACILITIES PROVIDED BY THE SOUND COMMAND IN THE BASIC INTERPETER. THIS IS VERY USEFUL AND CONVENIENT AND WAS ONE OF THE "IMPROVEMENTS" THAT THE VZ HAD OVER THE EARLIER TRS-80 COMPUTERS.

ENTER MY LISTING ENTITLED "STARWARS" AND LISTEN TO THE TUNE.

THERE ARE A COUPLE OF POINTS TO OBSERVE IN THIS TUNE. THE VOLUME AND TONE (TIMBRE) OF THE MELODY CANNOT BE VARIED. IN A COUPLE OF PLACES, THE TIMING OF THE TUNE IS DELAYED WHILST THE INTERPETER IS WRITING TO THE SCREEN. THE TIMING IS ALSO VARIED IN A COUPLE OF OTHER PLACES AS TRIPLETS (A NOTE OF A CERTAIN DURATION) ARE USED AND THESE ARE NOT PROVIDED IN THE INTERPETER. ALL-IN-ALL THOUGH, THE VZ MAKES A PRETTY FAIR FIST OF IT.

NEXT TIME WE WILL DISCUSS THE BASIC INTERPETER AND ACTUALLY THE MEANS BY WHICH SOFTWARE COMMANDS ARE CONVERTED IN TO PHYSICAL SOUND WAVES.

** ** ** STAR WARS THEME BY BOB KITCH ** ** **

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010 '***********************
020 '*  STAR WARS THEME  *
030 '*    BY BOB KITCH   *
040 '*       20/8/90     *
050 '***********************
060 A%=PEEK(30777):POKE 30777,1:POKE 30744,1:'SPEEDS UP PRINTING.
070 CLS:CLS:PRINT@480,"A LONG TIME AGO"
080 PRINT"IN A GALAXY FAR,FAR AWAY"
090 PRINT"A GREAT ADVENTURE TOOK PLACE.";:FOR I=0 TO 1000:NEXT I
100 SOUND 6,1;6,1;6,1
105 PRINT:PRINT:PRINT"IT IS A PERIOD OF CIVIL WAR.";
110 SOUND 11,4;18,4
120 SOUND 16,1;15,1;13,1;23,4;18,2
130 SOUND 16,1;15,1;13,1;23,4;18,2
140 SOUND 16,1;15,1;16,1;13,4;6,2;6,1
145 PRINT:PRINT:PRINT"REBEL SPACESHIPS"
146 PRINT"FIGHTING FROM A HIDDEN BASE";
150 SOUND 11,4;18,4
160 SOUND 16,1;15,1;13,1;23,4;18,2
170 SOUND 16,1;15,1;13,1;23,4;18,2
180 SOUND 16,1;15,1;16,1;13,4;6,2;6,1
185 PRINT:PRINT"HAVE WON THEIR FIRST VICTORY";
190 SOUND 8,3;8,1;16,1;15,1;13,1;11,1
200 SOUND 11,1;13,1;15,1;13,2;8,1;10,2;6,2;6,1
210 SOUND 8,3;8,1;16,1;15,1;13,1;11,1
220 SOUND 18,1;13,1;13,4;6,2;6,1
225 PRINT:PRINT"AGAINST THE EVIL"
226 PRINT"GALACTIC EMPIRE.";
230 SOUND 8,3;8,1;16,1;15,1;13,1;11,1
240 SOUND 11,1;13,1;15,1;13,2;8,1;10,2;18,2;18,1
250 SOUND 23,2;21,1;20,2;18,1;16,2;15,1;13,2;11,1
260 SOUND 18,5
300 SOUND 6,1;6,1;6,1
305 PRINT:PRINT:PRINT"DURING THE BATTLE";
310 SOUND 11,4;18,4
320 SOUND 16,1;15,1;13,1;23,4;18,2
330 SOUND 16,1;15,1;13,1;23,4;18,2
340 SOUND 16,1;15,1;16,1;13,4;6,2;6,1
345 PRINT:PRINT"REBEL SPIES MANAGED TO STEAL"
346 PRINT"SECRET PLANS TO THE EMPIRE'S"
347 PRINT"ULTIMATE WEAPON";
350 SOUND 11,4;18,4
360 SOUND 16,1;15,1;13,1;23,4;18,2
370 SOUND 16,1;15,1;13,1;23,4;18,2
380 SOUND 16,1;15,1;16,1;13,4;18,2
385 PRINT:PRINT:PRINT"          THE DEATH STAR.":PRINT
390 SOUND 23,8
400 SOUND 23,1;23,1;23,1
410 SOUND 23,1
415 PRINT"- AN ARMOURED SPACE STATION"
416 PRINT"WITH ENOUGH POWER TO DESTROY AN ENTIRE PLANET.";
420 FOR I=0 TO 2000:NEXT I
430 CLS:PRINT@195,"MAY THE FORCE BE WITH YOU."
440 FOR I=0 TO 1000:NEXT I
450 PRINT@430,""
460 POKE 30777,A%:POKE 30744,0
500 END
```

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                          001  ;
                          002  ;   *** TANDY ***
                          003  ;
                          004  ;VERSION OF THE EPSON PATCH
                          005  ;FOR THE TANDY PRINTER
                          006  ;JULY 13 1989
                          007  ;
AA4F  3E C3               008        LD    A,0C3H
AA51  32 C1 79            009        LD    (79C1H),A
AA54  21 66 AA            010        LD    HL,STRT
AA57  22 C2 79            011        LD    (79C2H),HL
AA5A  CD C9 01            012        CALL  01C9H
AA5D  21 11 AB            013        LD    HL,MES
AA60  CD A7 28            014        CALL  28A7H
AA63  C3 19 1A            015        JP    1A19H
AA66  3A 9C 78            016  STRT  LD    A,(789CH)
AA69  33                 017        INC   SP
AA6A  33                 018        INC   SP
AA6B  B7                 019        OR    A
AA6C  79                 020        LD    A,C
AA6D  C1                 021        POP   BC
AA6E  FA 54 3B            022        JP    M,3B54H
AA71  CA 3A 03            023        JP    Z,033AH
AA74  E5                 024        PUSH  HL
AA75  F5                 025        PUSH  AF
AA76  21 9B 78            026        LD    HL,789BH
AA79  34                 027        INC   (HL)
AA7A  7E                 028        LD    A,(HL)
AA7B  FE 4F              029        CP    4FH
AA7D  20 07              030        JR    NZ,POP
AA7F  36 00              031        LD    (HL),0
AA81  3E 00              032        LD    A,0DH
AA83  CD BA 3A            033        CALL  3ABAH
AA86  F1                 034  POP   POP   AF
AA87  E1                 035        POP   HL
AA88  FE 00              036        CP    0DH
AA8A  20 07              037        JR    NZ,FORD
AA8C  3E 00              038        LD    A,0
AA8E  32 9B 78            039        LD    (789BH),A
AA91  3E 0D              040        LD    A,0DH
AA93  B7                 041  FORD  OR    A
AA94  FA 9A AA            042        JP    M,TWOD
AA97  C3 BA 3A            043        JP    3ABAH
AA9A  CB 77              044  TWOD  BIT   6,A
AA9C  28 3A              045        JR    Z,GRPH
AA9E  E6 3F              046        AND   3FH
AAA0  F5                 047        PUSH  AF
AAA1  C5                 048        PUSH  BC
AAA2  D5                 049        PUSH  DE
AAA3  E5                 050        PUSH  HL
AAA4  6F                 051        LD    L,A
AAA5  26 00              052        LD    H,0
AAA7  3E 12              053        LD    A,12H
AAA9  CD BA 3A            054        CALL  3ABAH
AAAC  06 04              055        LD    B,4
AAAE  E5                 056        PUSH  HL
AAAF  D1                 057        POP   DE
AAB0  B7                 058        OR    A
AAB1  ED 5A              059  LP    ADC   HL,DE
AAB3  10 FC              060        DJNZ  LP
AAB5  E5                 061        PUSH  HL
```

```
AAB6  C1               062        POP   BC
AAB7  21  94  3B       063        LD    HL,3B94H
AABA  09               064        ADD   HL,BC
AABB  3E  FF           065        LD    A,0FFH
AABD  CD  BA  3A       066        CALL  3ABAH
AAC0  06  05           067        LD    B,5
AAC2  7E               068  LP1   LD    A,(HL)
AAC3  23               069        INC   HL
AAC4  CD  BA  3A       070        CALL  3ABAH
AAC7  10  F9           071        DJNZ  LP1
AAC9  3E  FF           072        LD    A,0FFH
AACB  CD  BA  3A       073        CALL  3ABAH
AACE  3E  1E           074        LD    A,1EH
AAD0  CD  BA  3A       075        CALL  3ABAH
AAD3  E1               076        POP   HL
AAD4  D1               077        POP   DE
AAD5  C1               078        POP   BC
AAD6  F1               079        POP   AF
AAD7  C9               080        RET
AAD8  C5               081  GRPH  PUSH  BC
AAD9  47               082        LD    B,A
AADA  3E  12           083        LD    A,12H
AADC  CD  BA  3A       084        CALL  3ABAH
AADF  78               085        LD    A,B
AAE0  E6  0F           086        AND   0FH
AAE2  E5               087        PUSH  HL
AAE3  CB  27           088        SLA   A
AAE5  4F               089        LD    C,A
AAE6  3E  1E           090        LD    A,1EH
AAE8  91               091        SUB   C
AAE9  4F               092        LD    C,A
AAEA  AF               093        XOR   A
AAEB  47               094        LD    B,A
AAEC  21  AF  02       095        LD    HL,02AFH
AAEF  09               096        ADD   HL,BC
AAF0  7E               097        LD    A,(HL)
AAF1  47               098        LD    B,A
AAF2  23               099        INC   HL
AAF3  7E               100        LD    A,(HL)
AAF4  4F               101        LD    C,A
AAF5  78               102        LD    A,B
AAF6  CD  BA  3A       103        CALL  3ABAH
AAF9  CD  BA  3A       104        CALL  3ABAH
AAFC  CD  BA  3A       105        CALL  3ABAH
AAFF  79               106        LD    A,C
AB00  CD  BA  3A       107        CALL  3ABAH
AB03  CD  BA  3A       108        CALL  3ABAH
AB06  CD  BA  3A       109        CALL  3ABAH
AB09  3E  1E           110        LD    A,1EH
AB0B  CD  BA  3A       111        CALL  3ABAH
AB0E  E1               112        POP   HL
AB0F  C1               113        POP   BC
AB10  C9               114        RET
AB11  0D               115  MES   DEFB  0DH
                       116        EQU   $
AB12  -   TEXT   -     117  *TANDY PRINTER PATCH LOADED*
AB2C  0D               118        DEFB  0DH
AB2D  00               119        NOP
AB2E  00               120        NOP
AB2F  00               121        NOP
BYTES FREE :- 21359 ERRORS : 00000
```

WORKING OUT CODES FOR SCREEN ADDRESSES

UNLIKE BASIC, WHICH ADDRESSES EACH INDIVIDUAL DOT WITH THE SET COMMAND, ASSEMBLER ADDRESSES GRAPHICS BY BYTES. A BYTE CONSISTS OF FOUR DOTS. EACH DOT HAS TWO BITS TO INDICATE THE COLOUR.

SO FOR ONE ADDRESS-LETS JUST SAY 7000H (THE FIRST SCREEN ADDRESS).

```
(PIXEL NUMBER)         1    2    3    4
                     *********************
(CONTENTS)           * 00 * 10 * 11 * 01 *
                     *********************
COLOR              GREEN RED    BLUE   YELLOW
                   BUFF  MAGENTA ORANGE CYAN
(BINARY NUMBER)      00    11     10     01
```

SO AS YOU CAN SEE THE PIXELS ARE REPRESENTED BY A BINARY VALUE. THEREFORE THE ABOVE BYTE WOULD BE GREEN (OFF), BLUE, RED AND YELLOW, IF THE BACKGROUND COLOUR WAS GREEN (COLOR,0). SO TO DISPLAY THIS YOU SIMPLY LOAD THE BINARY VALUE OF 00101101 OR 45 DECIMAL INTO ADDRESS 7000 HEX.

THIS IS DONE BY:

```
001      LD      A,45         ;NUMBER TO LOAD TO ADDRESS
002      LD      (7000H),A    ;ADDRESS TO LOAD IT TO
```

IT'S THAT SIMPLE!!!!!

PROGRAM NINE — PERSON :
A GOOD EXAMPLE TO SHOW THE USE OF THIS IS TO DRAW A PERSON.

```
00001        LD    A,8          ;ENTER MODE(1)
00002        LD    (6800H),A
00003        LD    HL,7000H
00004        LD    DE,7001H
00005        LD    BC,7FFH
00006        LD    (HL),0
00007        LDIR
00008        LD    A,40         ;FIRST CODE
00009        LD    (28672),A    ;FIRST ADDRESS
00010        LD    (28704),A    ;SECOND ADDRESS
00011        LD    (28768),A    ;THIRD ADDRESS
00012        LD    (28800),A    ;FOURTH ADDRESS
00013        LD    A,170        ;SECOND CODE
00014        LD    (28736),A    ;FIFTH ADDRESS
00015        LD    (28832),A    ;SIXTH ADDRESS
00016        LD    B,100        ;START OF DELAY
00017 DLY    LD    HL,6000
00018 DLY2 DEC    HL
00019        LD    A,H
00020        OR    L
00021        JP    NZ,DLY2
00022        DJNZ  DLY
00023        JP    7B00H
```

PROGRAM TEN — FILLER :
THIS PROGRAM DEMONSTRATES THE USE OF GRAPHICS AND THE SCANNING OF KEYS. WHEN IT IS RUN IT WAITS FOR THE COMMA KEY TO BE PRESSED. IF THIS IS DONE IT FILLS UP THE SCREEN WITH GRAPHICS UNTIL THE KEY IS RELEASED OR THE END OF THE VIDEO SCREEN IS REACHED. IF THIS HAPPENS OR THE 'Q' KEY IS PRESSED THE PROGRAM JUMPS BACK TO THE ASSEMBLER.

```
00001        LD    A,8              00020        JR    Z,STWO
00002        LD    (6800H),A        00021        CP    2CH
00003        LD    HL,7000H         00022        JR    NZ,SCAN
00004        LD    DE,7001H         00023        POP   DE
00005        LD    BC,7FFH          00024        POP   HL
00006        LD    (HL),0           00025        INC   DE
00007        LDIR                   00026        INC   HL
00008        LD    HL,7000H         00027        LD    BC,1
00009        LD    DE,7001H         00028        LD    (HL),255
00010        PUSH  DE               00029        LDIR
00011        PUSH  HL               00030        PUSH  HL
00012 SCAN   CALL  2EF4H            00031        LD    HL,77FFH
00013        OR    A                00032        RST   18H
00014        JR    Z,SCAN           00033        JR    C,QUIT
00015        CP    51H              00034        PUSH  DE
00016        JR    NZ,STWO          00035        JP    SCAN
00017        JP    QUIT             00036 QUIT   CALL  1C9H
00018 STWO   CALL  2EF4H            00037        JP    7800H
00019        OR    A
```

```
LINE 1  CLEARS THE VIDEO SCREEN
LINE 8  SETS UP THE VIDEO ADDRESSES
LINE 12 SCANS FOR THE KEYS BEING PRESSED
LINE 15 WAS IT 'Q' (FOR QUIT)
LINE 21 WAS IT ',' (COMMA)
LINE 23 DRAW DOT
LINE 30 CHECK IF END OF VIDEO IS REACHED, IF SO GO TO QUIT
LINE 36 QUIT
```

PROGRAM ELEVEN — MOVE DOT :

THIS PROGRAM USES THE 'Q A M , KEYS TO MOVE A DOT AROUND THE SCREEN. IF THE TOP OR BOTTOM OF THE SCREEN IS REACHED THE DOT DISAPPEARS BUT IT DOES NOT KEEP GOING. WHEN YOU CHANGE DIRECTION IT REAPPEARS. IF THE SIDES OF THE SCREEN ARE REACHED IT WRAPS AROUND TO THE OTHER SIDE BUT ON THE NEXT LINE.

THE PROGRAM MAKES USE OF LOOPS, CALLS AND RETS, KEY INPUTS AND GRAPHICS. IT COULD BE THE BASIS OF A GAME. (THEY ALL START SOMEWHERE). THE COMMENTS HERE ONLY APPLY TO THE START OF THE ROUTINES. IF YOU STUDY THEM CAREFULLY YOU SHOULD BE ABLE TO FIGURE THEM OUT.

```
00001        LD    A,8              00019        OR    A
00002        LD    (6800H),A        00020        JR    Z,SCNA
00003        LD    HL,7000H         00021        CP    41H
00004        LD    DE,7001H         00022        JR    NZ,SCNM
00005        LD    BC,2047          00023        JP    DOWN
00006        LD    (HL),0           00024 SCNM   CALL  2EF4H
00007        LDIR                   00025        OR    A
00008        LD    A,40             00026        JR    Z,SCNM
00009        LD    HL,73F0H         00027        CP    4DH
00010        LD    (HL),A           00028        JR    NZ,SCNR
00011        PUSH  HL               00029        JR    LEFT
00012 SCNQ   CALL  2EF4H            00030 SCNR   CALL  2EF4H
00013        OR    A                00031        OR    A
00014        JP    Z,SCNQ           00032        JR    Z,SCNR
00015        CP    31               00033        CP    2CH
00016        JR    NZ,SCNA          00034        JR    NZ,SCNX
00017        JP    UP               00035        JR    RIGH
00018 SCNA   CALL  2EF4H            00036 SCNX   CALL  2EF4H
```

```
00037         OR    A              00086         CALL  DECR
00038         CP    58H            00087         PUSH  HL
00039         JR    NZ,SCNQ        00088         LD    DE,77E0H
00040         JP    EXIT           00089         RST   18H
00041 RIGH    POP   HL             00090         JR    NC,FIX3
00042         LD    A,0            00091         LD    DE,701F
00043         LD    (HL),A         00092         RST   18H
00044         INC   HL             00093         JR    C,FIX3
00045         PUSH  HL             00094         JR    DRAW
00046         LD    DE,77E0H       00095 FIX3    POP   HL
00047         RST   18H            00096         CALL  INCR
00048         JR    NC,FIX1        00097         PUSH  HL
00049         LD    DE,701F        00098         JP    SCNQ
00050         RST   18H            00099 DOWN    POP   HL
00051         JR    C,FIX1         00100         LD    A,0
00052         JR    DRAW           00101         LD    (HL),A
00053 FIX1    POP   HL             00102         CALL  INCR
00054         DEC   HL             00103         PUSH  HL
00055         PUSH  HL             00104         LD    DE,77E0H
00056         JR    SCNQ           00105         RST   18H
00057 LEFT    POP   HL             00106         JR    NC,FIX4
00058         LD    A,0            00107         LD    DE,701FH
00059         LD    (HL),0         00108         RST   18H
00060         DEC   HL             00109         JR    C,FIX4
00061         PUSH  HL             00110         JR    DRAW
00062         LD    DE,77E0H       00111 FIX4    POP   HL
00063         RST   18H            00112         CALL  DECR
00064         JR    NC,FIX2        00113         PUSH  HL
00065         LD    DE,701FH       00114         JP    SCNQ
00066         RST   18H            00115 EXIT    CALL  01C9H
00067         JR    C,FIX2         00116         CALL  3450H
00068         JR    DRAW           00117         CALL  DLAY
00069 FIX2    POP   HL             00118         JP    7B00H
00070         INC   HL             00119 INCR    LD    B,20H
00071         PUSH  HL             00120 LOP1    INC   HL
00072         JR    SCNQ           00121         DJNZ  LOP1
00073 DRAW    CALL  DLAY           00122         RET
00074         LD    B,100          00123 DECR    LD    B,20H
00075 LOP3    LD    HL,100         00124 LOP2    DEC   HL
00076         DEC   HL             00125         DJNZ  LOP2
00077         DJNZ  LOP3           00126         RET
00078         POP   HL             00127 DLAY    LD    B,100
00079         LD    A,40           00128 DLY1    LD    HL,75
00080         LD    (HL),A         00129 DLY2    DEC   HL
00081         PUSH  HL             00130         LD    A,H
00082         JP    SCNQ           00131         OR    L
00083 UP      POP   HL             00132         JP    NZ,DLY2
00084         LD    A,0            00133         DJNZ  DLY1
00085         LD    (HL),0         00134         RET
```

```
LINE 1    CLEARS THE VIDEO SCREEN           LINE 8    SETS UP DOT'S START POSITION
LINE 11   SCAN FOR 'Q' BEING PRESSED        LINE 17   SCAN FOR 'A' BEING PRESSED
LINE 23   SCAN FOR 'M' BEING PRESSED        LINE 29   SCAN FOR ',' BEING PRESSED
LINE 35   SCAN FOR 'X' BEING PRESSED (EXIT) LINE 40   MOVE DOT TO THE RIGHT
LINE 56   MOVE DOT TO THE LEFT              LINE 72   DRAW DOT IN ITS NEW POSITION
LINE 82   MOVE DOT UPWARDS                  LINE 98   MOVE DOT DOWNWARDS
LINE 114  JUMP BACK TO THE ASSEMBLER        LINE 118  INCREMENT ROUTINE FOR DOWN
LINE 122  DECREMENT ROUTINE FOR UP          LINE 126  DELAY ROUTINE
```

FOR FOLK WHO WISH TO MODIFY THEIR PRESENT *PM DB* UNITS AND REQUIRE HELP TO "UNLOCK" IT PLEASE CONTACT MYSELF, THE EDITOR OF THIS MAGAZINE, MR LARRY TAYLOR OR SOME OTHER VZ "SPECIALISTS".

JOHN D'ALTON   39 AGNES STREET   TOOWONG   QLD   4066
LARRY TAYLOR   4 COLUMBIA COURT   SPRINGWOOD   QLD   4127
THE EDITOR   H V VZ JOURNAL   PO BOX 161   JESMOND   2299

ONLY REQUESTS BY MAIL THAT INCLUDE A SSAE ENVELOPE WILL BE ANSWERED.

REFER TO MY PREVIOUS ARTICLE IN THIS MAGAZINE TITLED "UTILITIES FOR DSE. DISC DATABASE" WHERE I OUTLINED SOME VERY USEFUL MODS THAT I HAVE DEVELOPED AND NOW PASS ON TO INTERESTED FOLK.

THE DATABASE UNIT WHICH THE AUTHOR MR. PHIL MAUDE WROTE WAS SOLD BY DSE. HE HAS NOW LIFTED COPYRIGHT ON IT WHICH NOW ALLOWS THESE MODIFICATIONS TO BE MADE. THAT UNIT I CALL *PM DB* AND FOR THE NEW MODIFICATIONS I SHALL CALL THE UNIT *PM DB JD M.*

I WILL PRESENT THE ARTICLES IN PRINTED FORM ONLY, NOT ON DISC. IT IS UP TO THE READER TO TYPE IN THE BASIC MODS. YOU WILL NEED TO UNDERSTAND A LITTLE OF THE BASIC LANGUAGE TO PERHAPS DO ANY REQUIRED CORRECTIONS. HOPEFULLY THERE WILL NOT BE TOO MANY "BUGS" FOR YOU TO IRON OUT. THE MODS ARE PROGRAMMED IN BLOCK FORM SO YOU SHOULD NOT HAVE TOO MUCH TROUBLE. THERE ARE SOME PROGRAMMING REMARKS STILL REMAINING AND CAN BE REMOVED IF DESIRED. IN SOME CASES YOU MAY HAVE TO ALTER DIM STATEMENTS AND SUCH LIKE. YOU MAY ALSO HAVE TO INITIALISE NEW VARIABLES THAT I HAVE USED.

I DO NOT ACCEPT ANY RESPONSIBILITY FOR ANY ERRORS IN THE BASIC PROGRAMMES OR FOR ANY LOSS OR CORRUPTION OF DATA FILES. YOU SHOULD MAKE BACK-UP OF ALL FILES IN ANY CASE. IN MY PREVIOUS ARTICLE I NUMBERED THE MODS 1 TO 7. I WILL NOT PRESENT THE MODS IN THIS ORDER. THE MOD NUMBERED 2 WIL BE THE FIRST ONE. SO HERE GOES. BEST OF LUCK.

2. ALTER THE SYSOP DATA

WITH THE ORIGINAL *PM DB* THERE WAS NO WAY OF ALTERING THIS ONCE IT WAS MADE. IF AFTER SOME TIME (WEEKS/MONTHS) YOU WANTED TO DO THIS, IT MEANT STARTING FROM SCRATCH, SETTING UP A NEW FILE SYSOP AND TYPING IN ALL THE RECORDS DATA AGAIN. SAY YOUR FILE WAS CALLED "AUSTRALIAN STAMPS" AND YOU NEED TO RENAME IT "AUSTRALIAN STAMPS 1" THEN THIS CAN BE DONE ON THE FIRST PROMPT. THE AMOUNT OF CHARS (CHARACTERS) DOES NOT HAV TO BE THE SAME.

THE NUMBER OF PRINTER COLUMNS CAN ONLY BE INCREASED (AT PRESENT). THIS TIES IN WITH THE AMOUNT OF FIELDS, CHARS PER FIELD AND SPACES BETWEEN FIELDS. THE NAME OF ONE OR MORE FIELDS CAN BE ALTERED WITHOUT COUNTING THE LENGTH OF THE NAME. THE LENGHT OF A FIELD CAN BE INCREASED (NOT DECREASED AT PRESENT). ONLY ONE FIELD LENGTH CAN BE ALTERED AT A TIME AND REMEMBER TO CALCULATE THIS IN RELATION TO THE "AMOUNT OF PRINTER COLUMNS".

NOW TO THE MODIFICATIONS

LINES 20, 30 AND 31.

```
20 DIM FN$(25),FL(25),L$(100),F$(25),N$(100),D$(100),LP(20)
22 'FOR TRANSFER USE DIM N1$(200),K$(200),LL$(200)
30 TL=0:J=0:I=0:X=0:N=0:FL=0:F=0:R=0:A=0
31 M1$="-------------------------------------":REM 31 MINUSES
```

LINE 9072.

```
9072 GOSUB 9500:RETURN
```

THE ACTUAL SECTION THAT ALTERS THE SYSOP THAT YOU TYPE IN:-

LINES 9500 TO 9576.

```
9500 'ALTER FIELD NAMES
9504 CLS:PRINT"FILE NAME = ";FL$
9505 PRINT"AMOUNT OF FIELDS = ";N:LP(1)=1
9507 FOR L=1 TO N:LP(L+1)=LP(L)+1+FL(L)
9509 PRINT"LEFT TAB = ";LP(L);"LENGTH =";FL(L):NEXT
9514 PRINT:PRINT"ALTER FIELDS OR PRINTER COLUMNS"
9516 INPUT" Y/N ";Q$:IF Q$="N" RETURN ELSE 9518
9518 PRINT"FILENAME IS ";FL$;INPUT"OK Y/N ";Q$
9520 IF Q$="Y" THEN 9524 ELSE 9521
9521 INPUT"TYPE IN NEW FILENAME
          ";FL$:REM 11 SPACES
9524 PRINT"AMOUNT OF PRNTR COLS = ";PT:INPUT"PRINTER OK Y/N ";Q$
9525 IFQ$="Y"THEN 9530 ELSE INPUT"PRINTER COLS";PT:CLS:GOTO 9530
9530 CLS
9532 FOR Z=0 TO N
9534 PRINT"FIELD ";Z;"IS ";FN$(Z)
9537 NEXT Z
9540 PRINT M1$:INPUT"WHICH FIELD TO ALTER ";Z:PRINT M1$
9542 PRINT"FIELD ";Z;"WAS   "FN$(Z)
9543 PRINT"  FIELD LENGTH = ";FL(Z)
9545 PRINT
9550 PRINT"   TYPE NEW FIELD NAME"
9552 INPUT"          ";FN$(Z):PRINT M1$:REM 8 SPACES
9554 PRINT"FIELD";Z;"IS NOW ";FN$(Z):PRINT
9560 INPUT"ALTER FIELD LENGTH Y/N ";Q$:IF Q$="N" THEN 9565
9562 INPUT"TYPE NEW FIELD LENGTH ";FL(Z)
9564 PRINT"NEW FIELD LENGTH = ";FL(Z):PRINT M1$
9565 INPUT"ADD MORE OR DELETE FIELDS Y/N ";Q$
9566 IF Q$="Y"THEN 9567 ELSE 9570
9567 INPUT"<A>DD MORE OR <D>ELETE ";Q$:IF Q$="A"THEN9568ELSE9569
9568 INPUT"HOW MANY MORE ";Z2:N=N+Z2:CLS:GOTO 9570
9569 INPUT"HOW MANY LESS ";Z2:N=N-Z2:CLS:GOTO 9570
9570 PRINT M1$:PRINT"MORE TO ALTER OR ADD ";
9572 INPUT"MORE FIELDS Y/N ";Q$:IF Q$="Y"THEN 9500
9574 CLS:PRINT"   IS DISC IN DRIVE?":INPUT"  PRESS RETURN";Q$
9575 SOUND 30,2;20,2:ERA"SYSOP"
9576 GOSUB 9039:RETURN
```

WHEN YOU ARE FINISHED THE OLD SYSOP IS ERASED AND NEW SYSOP IS SAVED.

THE NEXT NORMAL OPERATION OF *PM DM* IS TO LOAD THE RECORDS FILE.
IF WITH *PM DB JD M* YOU HAVE ALTERED THE LENGTH OF A FIELD, THE NEXT
MOD MUST BE TYPED IN. THIS IS LINE 1530. ALSO LINES 1540 TO 1592 AND
LINES 9400 TO 9450.

LINE 1530.

```
1530 SOUND 25,1;0,9;0,9:
```

LINES 1540 TO 1592

```
1540 ' INSERT SPACES & REPACK
1542 CLS:PRINT"  ";I-1;" RECORDS WERE LOADED"
1543 PRINT:PRINT" IF A FIELD LENGTH HAS BEEN ALT-ERED AND SAV";
1544 PRINT"ED AS SYSOP, THEN THE EXISTING DATA HAS TO BE ";
```

LINES 1540 TO 1592 CONTINUED

```
1545 INPUT" WAS A FIELD LENGTH  CHANGED        Y/N";Q$
1547 IF Q$="N"THEN GOTO 500
1550 PRINT M1$:INPUT"WHICH FIELD ";FL
1552 INPUT"# OF ADDED SPACES ";SP:SQ$=" ":L$="":SP$="":SR=SP
1556 FOR Z=1 TO SP:SP$=SP$+" "
1560 IF LEN(SP$)<SP THEN 1556
1562 PRINT:PRINT"  DATA BEING REPACKED"
1564 FOR I=1 TO R:GOSUB 9400
1566 FOR J=1 TO N
1568 IF J=FL THEN SO$=SP$+" " ELSE SO$=SQ$
1570 TS$=L$+F$(J)+SO$:N$(I)=N$(I)+TS$:NEXT J
1571 L$(I)=N$(I)
1583 '
1585 NEXT I
1588 CLS:PRINT:PRINT:PRINT" NOW TO RESAVE DATA ONTO DISC"
1590 PRINT:INPUT"INSERT DISC & PRESS RETURN";Q$:GOSUB 4000
1592 GOTO 500
1599 END
```

LINES 9400 TO 9450

```
9400 REM UNPACK STRING WHEN FLD LGT ALTERED
9402 SP=SR:L$=""
9410 FOR J=1 TO N:IF J=1 THEN X=1
9412 IF J=FL THEN FL(J)=FL(J)-SP
9420 F$(J)=MID$(L$(I),X,FL(J))
9430 X=1+X+FL(J)
9435 IF J=FL THEN FL(J)=FL(J)+SP
9450 NEXT J:RETURN
```

MR MAUDE DESIGNED *PM DB* TO "PACK" THE DATA TOGETHER, SEPERATED WITH A SPACE. EI.

FIELD 1 IS 10 CHARS LONG AND FIELD 2 IS 5 CHARS LONG. EI.
FIELD 1 DATA IS "SMITH" AND FIELD 2 DATA IS "QLD".
BEFORE PACKING THIS IS, (A DASH REPRESENTS A SPACE):-

SMITH------QLD---
AFTER PACKING IS:-
SMITH-QLD-

NOW IF YOU ALTERED THE LENGTH OF FIELD 1 FROM 10 TO 15 THEN THE EXTRA 5 SPACES MUST BE FITTED INTO THAT FIELD. IF THE WORD IS "THOMASETI" THEN 6 EXTRA SPACES ARE PACKED IN, PLUS THE END OF FIELD (EOF) SPACE.

AFTER THE RECORDS FILE HAS BEEN LOADED YOU ARE ASKED IF A FIELD LENGTH HAS BEEN ALTERED. IN THIS CASE ANSWER YES. YOU THEN TYPE IN THE AMOUNT OF EXTRA SPACES, EI, 5 IN THIS CASE. THE RE-PACKING OF THE FIELD ALTERED OF ALL THE RECORDS IS NOW DONE. EVERY FIELD AFTER THE FIELD ALTERED IS MOVED TO THE RIGHT BY 5. THIS IS CARRIED OUT TO EVERY RECORD. SO IF THE END OF THE RECORD COUNTED TO 90 CHARS, IT WOULD NOW BE 95. UNDERSTAND?

THIS RE-PACKING TAKES A MINUTE OR SO. DEPENDING ON THE NUMBER OF RECORDS ON THE FILE. THE OLD FILE IS ERASED AND THE NEW FILE IS SAVED. GO STAIGHT TO THE "PRINT FILE" ON PRINTER AND ALL SHOULD BE OK. TEST ON A SMALL FILE OF SAY 5 RECORDS AT FIRST. IF ALL OK THEN ANOTHER FIELD LENGTH CAN BE ALTERED TO RECHECK.

AS MENTIONED IN LAST ISSUE THE AVAILABILITY OF CHEAP LARGE CAPACITY MEMORY DEVICES BOTH STATIC AND DYNAMIC CAN EXPAND THE VZ HORIZONS CONSIDERABLY. WITH COMPATIBILITY OF PREVIOUS EXPANSIONS AND STANDARDS IN MIND I PROPOSE AND ADD THE FOLLOWING STANDARDS:
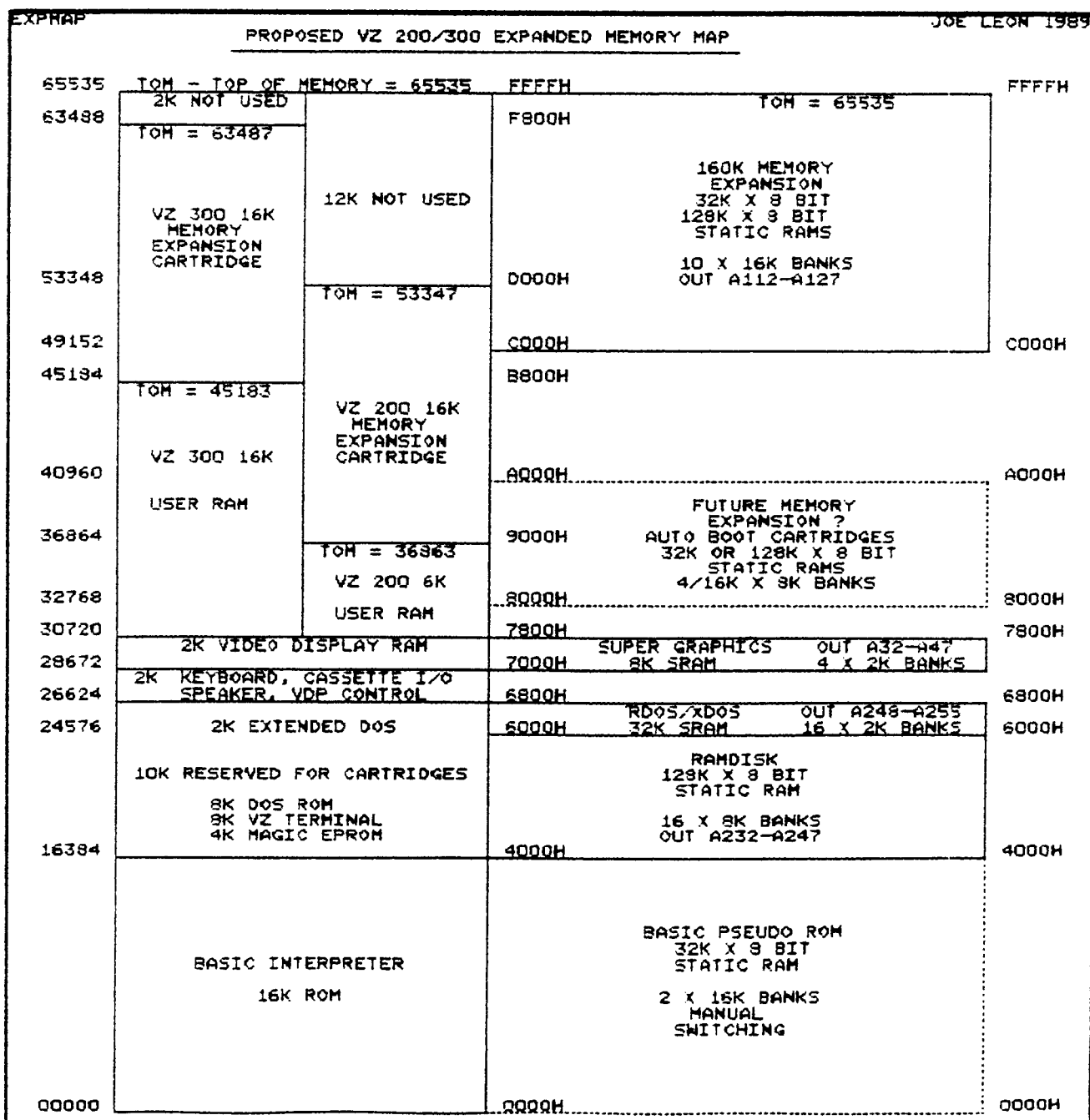
```
MAIN MEMORY      - C000H-FFFFH - OUTPUT PORT A112-A127 - 16K BANKS
AUTO BOOT        - 8000H-9FFFH - OUTPUT PORT A216-A231 -  8K BANKS
SUPER GRAPHICS   - 7000H-77FFH - OUTPUT PORT  A32-A47  -  2K BANKS
RDOS             - 6000H-67FFH - OUTPUT PORT A232-A247 -  2K BANKS
RAMDISK          - 4000H-5FFFH - OUTPUT PORT A248-A255 -  8K BANKS
```

AUTO BOOT = MORE ON IT NEXT ISSUE.
RDOS   = RAM DISK OPERATING SYSTEM. WILL CONTROL RAMDISK AND ITS DATA STORAGE/RETRIEVAL OPERATIONS.
RAMDISK   = VERY FAST MEMORY BASED PROGRAM & DATA STORAGE/RETRIEVAL AREA SIMILIAR TO DISK DRIVE.

NOTE : ANY COMMENTS ON ABOVE PLEASE CONTACT THE EDITOR.

PROPOSED VZ 200/300 EXPANDED MEMORY MAP — JOE LEON 1989

```
**********************************************************************
*                                                                    *
*      LOOK !!!! --- PROGRAMS FOR SALE --- ALL NEW !!!!              *
*                                                                    *
**********************************************************************
```

<1>   V Z   D I S A S S E M B L E R
`####################################`

WHAT, ANOTHER DISASSEMBLER? BUT, YOU HAVE ALREADY GOT ONE?   THIS ONE IS DIFFERENT!

THIS PROGRAM IS ENTIRELY WRITTEN IN MACHINE CODE. IT ACTUALLY RUNS ABOUT 40 TIMES FASTER THAN D.S.E.'S DISASSEMBLER (OR ANY ONE ELSE'S).   IT WILL DISASSEMBLE ANY PROGRAM THAT YOU CAN BLOAD INTO MEMORY. IT WORKS WITH ANY VZ CONFIGURATION. IT DISASSEMBLES EVEN THE 88 EXTRA Z80 OPCODES THAT ZILOG DOESN'T ADMIT TO.

PRICE? ONLY $25.00 - TAPE AND DISK VERIONS AVAILABLE.

PRICE INCLUDES HARDCOPY MANUAL. INTERESTED? YOU MAY PURCHASE THIS PROGRAM FROM PETER HICKMAN, FOR ADDRESS SEE BELOW.

```
**********************************************************************
*                                                                    *
*  BRAND NEW   -   VZ SERIAL INTERFACE PROGRAM   -   BRAND NEW  *
*                                                                    *
**********************************************************************
```

<2>   V Z   M O D E M   S O F T W A R E
`######################################`

DID YOU WANT TO TALK TO OTHER COMPUTERS VIA A MODEM? DID YOU BUY THE DSE TERMINAL EPROM, ONLY TO DISCOVER THAT IT ONLY WORKS WITH TAPE. IT ONLY ALLOWS YOU TO PRINT FILES, NOT SAVE THEM OR SEND THEM!

YOUR PROBLEMS ARE SOLVED! THE HICKMAN BROTHERS, PETER AND ANDREW, HAVE A BRAND NEW PROJECT WHICH WILL ALLOW YOU TO SEND, RECEIVE & SAVE FILES VIA A MODEM. IT WORKS WITH DISK!

SALE PRICE $25.00 ONLY

INCLUDED ARE INSTRUCTIONS FOR THE HARDWARE MODIFICATIONS.

A SMALL MODIFICATION IS NEEDED TO YOUR DISK CONTROLLER. YOUR USER GROUP MAY HELP YOU MODIFY YOUR COMPUTER TO USE THIS EXCITING NEW SOFTWARE! IF YOU HAVE THE FUNCTION KEYS MOD AS WELL, THEN YOU WILL BE ABLE TO SEND EXTRA ASCII CHARACTERS SUCH AS:-

{ ! } ~ _

THE MANUAL IS SUPPLIED ON DISK FOR YOU TO PRINT OUT WITH YOUR DISK VERSION OF E & F WORDPROCESSOR. IF YOU DO NOT OWN AN E & F WORDPROCESSOR PROGRAM, PLEASE ENCLOSE ANOTHER $5.00 (TOTAL $30.00) FOR PHOTOCOPYING AND POSTAGE OF THE MANUAL.

FOR PURCHASE OR MORE INFORMATION CONTACT:-
PETER HICKMAN P.O. BOX 8, WERRINGTON N.S.W. 2747.

PATCH 3.3 WRITTEN BY DAVE MITCHELL WILL CONVERT YOUR E & F TAPE WORD PROCESSOR FOR FULL DISK USE WHILE RETAINING ALL ORIGINAL FUNCTIONS. BELOW ARE ADDED DISK COMMANDS & FUNCTIONS :-

LOAD, SAVE, ERASE, RENAME, DIRECTORY, INITIALIZE, UPDATE, DRIVE 1 & 2, SHIFTLOCK & IMBEDDED PRINTER CONTROL CODES PLUS CTRL+P WHICH BYPASSES PRINT MENU AND PRINTS TO SCREEN OR PRINTER. A ROUTINE IS ALSO PROVIDED TO CONVERT YOUR BASIC PROGRAM OR SOURCE CODE FILES INTO WORD PROCESSOR FILES.

PATCH 3.3 HAS PROVISION FOR IMBEDDING PRINTER CONTROL CODES IN TEXT AND FAST SAVING AND LOADING OF TEXT DATA TO AND FROM DISK USING BLOCK SAVE/LOAD TECHNIQUES. PRINTER CONTROL CODES CAN BE SAVED TO TAPE OR DISK.

BSTWP.F - THIS UTILITY PROVIDED WITH PATCH 3.3 WILL CONVERT BASIC PROGRAMS AND ED/ASS. SOURCE CODE FILES INTO WORD PROCESSOR FILES.

SYSTEM REQUIREMENTS - VZ 300 + 16K RAM PACK - VZ 200 + 26K

PATCH 3.3 IS COPYRIGHT TO AND ONLY AVAILABLE FROM :-
HUNTER VALLEY VZ USERS' GROUP   P.O.BOX 161 JESMOND 2299
N.S.W. AUSTRALIA - PHONE JOE LEON (049) 51 2756

PRICE - AUS/NZ AU$20.00 - UPDATE - AUS-$10.00 - NZ-AU$11.00.
UPDATING AVAILABLE ONLY TO PREVIOUS PURCHASERS OF PATCHES.

FOR MORE INFORMATION WRITE TO H.V.VZ.U.G. ENCLOSING A SSAE.

EXTENDED DOS V1.3 - $15.00

UPDATED VERSION WITH EXTRA COMMANDS ADDED :-

OLD COMMANDS - MERGE, DIRA, LDIRA, DIRB, LDIRB, OLD, OLD., DEC, HEX, STATUSA AND LSTATUSA. STATUSA AND LSTATUSA ALSO WORKS WITH VERSION 1.0 DOS.

NEW COMMANDS :-

MENU   - LOADS AND RUNS BINARY OR TEXT MENU PROGRAM FROM DISK.
CODE   - SIMPLIFIES USING PRINTER CONTROL CODES DIRECTLY OR FROM
           WITHIN A PROGRAM.
LTAB   - IS FOR SETTING OF LEFT MARGIN.
MOVE   - MOVES BASIC FILE FROM DISK TO CHOSEN MEMORY ADDRESS.
UPD   - ERASES OLD FILE AND SAVES WITH SAME FILE NAME.

MENU/FILE COPIER - $15.00

THIS UTILITY WILL READ YOUR DISK DIRECTORY AND PRESENT YOU WITH SEVERAL OPTIONS. USING THE CURSOR YOU CAN RUN/BRUN ANY PROGRAM OR SELECT FILE COPY, REN, ERASE, DRIVE 1 OR 2, ETC. BESIDES COPYING TEXT AND BINARY FILES ALL OTHER FILES CAN BE COPIED AS WELL EXEPT FOR DATA FILES.

FOR PURCHASE OR INFORMATION CONTACT DAVE MITCHELL - (079) 27 3519
24 ELPHINSTONE ST. NORTH ROCKHAMPTON QUEENSLAND 4701

FOR INFORMATION OR DEMONSTRATION IN NEWCASTLE AREA CONTACT :-
JOE LEON - (049) 51 2756 - 22 DRURY STREET WALLSEND NSW 2287

CONTRIBUTIONS TO THE HUNTER VALLEY VZ JOURNAL :-

     IF YOU ARE THINKING OF CONTRIBUTING TO THE JOURNAL THE PREFERED
FORMAT IS BASIC LISTINGS, WORD PROCESSOR OR SOURCE CODE FILES ON TAPE
OR DISK. FILES FROM THE FOLLOWING WORD PROCESSORS CAN BE ACCEPTED :-

E & F TAPE OR DISK PATCH 3.1-3.3, WORDPRO CARTRIDGE, WORDPRO PATCH,
MOST SOURCE CODE FILES AND ALL QUICKWRITE WORD PROCESSOR FILES.

** ** CLUB MEETINGS - ALL WELCOME ** **

FIRST FRIDAY OF MONTH - NO MEETING IN JANUARY 1991

VENUE - JESMOND NEIGHBOURHOOD CENTRE MORDUE PARADE JESMOND
(REAR STOCKLAND MALL - BIG W)

DECEMBER 7 - REVIEWING 1990 & PREVIEWING 1991
              BASIC - MACHINE CODE & ASSEMBLY CONTINUED
              CHRISTMAS PARTY - BRING FAMILY - FRIENDS - PLATE
              HOT & COLD LIQUID REFRESHMENTS PROVIDED - ALL WELCOME

JANUARY 4 - NO MEETING

FEBRUARY 1 - BASIC - MACHINE CODE & ASSEMBLY CONTINUED
             DEMO - IF READY 320K MEMORY EXPANSION
             NOTIFIED IN NEXT ISSUE IF OTHERWISE

FUTURE DEMONSTRATIONS -

EPROM PROGRAMMER & ERASER, AUCTION NIGHT - USING THE VZ, RITTY, ETC.
IF YOU HAVE ANY IDEAS FOR A DEMONSTRATION OR A SUBJECT THEN PLEASE LET
YOUR COMMITTEE KNOW.

CLUB COMMITTEE & SUBSCRIPTIONS -

PRESIDENT --------- ROSS WOODS --- (049) 71 2843
SECRETARY/EDITOR -- JOE LEON ----- (049) 51 2756
TREASURER --------- GARY BULLEY -- (049) 54 7561
COMMITTEE MEMBERS - COLIN BRIDGE - PETER JONES

SUBSCRIPTION TO - AUST. - 6 MONTHS $11.00 - 12 MONTHS $21.00
H.V.VZ.JOURNAL - N. Z. - 6 MONTHS $13.00 - 12 MONTHS $26.00
NOTE: PRICES INCLUDE POST & PACKING

HUNTER VALLEY VZ USERS' GROUP - PO BOX 161 JESMOND 2299
NEW SOUTH WALES AUSTRALIA

VZ USER GROUPS & PUBLICATIONS --

VZ DOWN UNDER - VZ MAGAZINE - 6 ISSUES - $18.00 PER ANUM
HARRY HUGGINS 12 THOMAS SREET MITCHAM VICTORIA 3132

WAVZ - WESTERN AUSTRALIA VZ USER GROUP
GRAEME BYWATER   P O BOX 388   MORLEY W A 6062

BRISBANE VZ USERS WORKSHOP - C/O 63 TINGALPA ST. WYNUM WEST 4178
SOFTWARE FOR SALE - DISK MENU

SAPPHIRE PRODUCTIONS - VZ DISK MAGAZINE - $20.00 PER ANUM
CONTACT JASON OAKLEY PO BOX 600 TAREE NSW 2430

NOTE : WHEN WRITING TO ANY ABOVE OR H.V.VZ. USERS' GROUP FOR
INFORMATION PLEASE ENCLOSE A S.S.A.E. OR NZ 2 INT. REPLY COUPONS.