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FIELD MAINTENANCE PRINT SET

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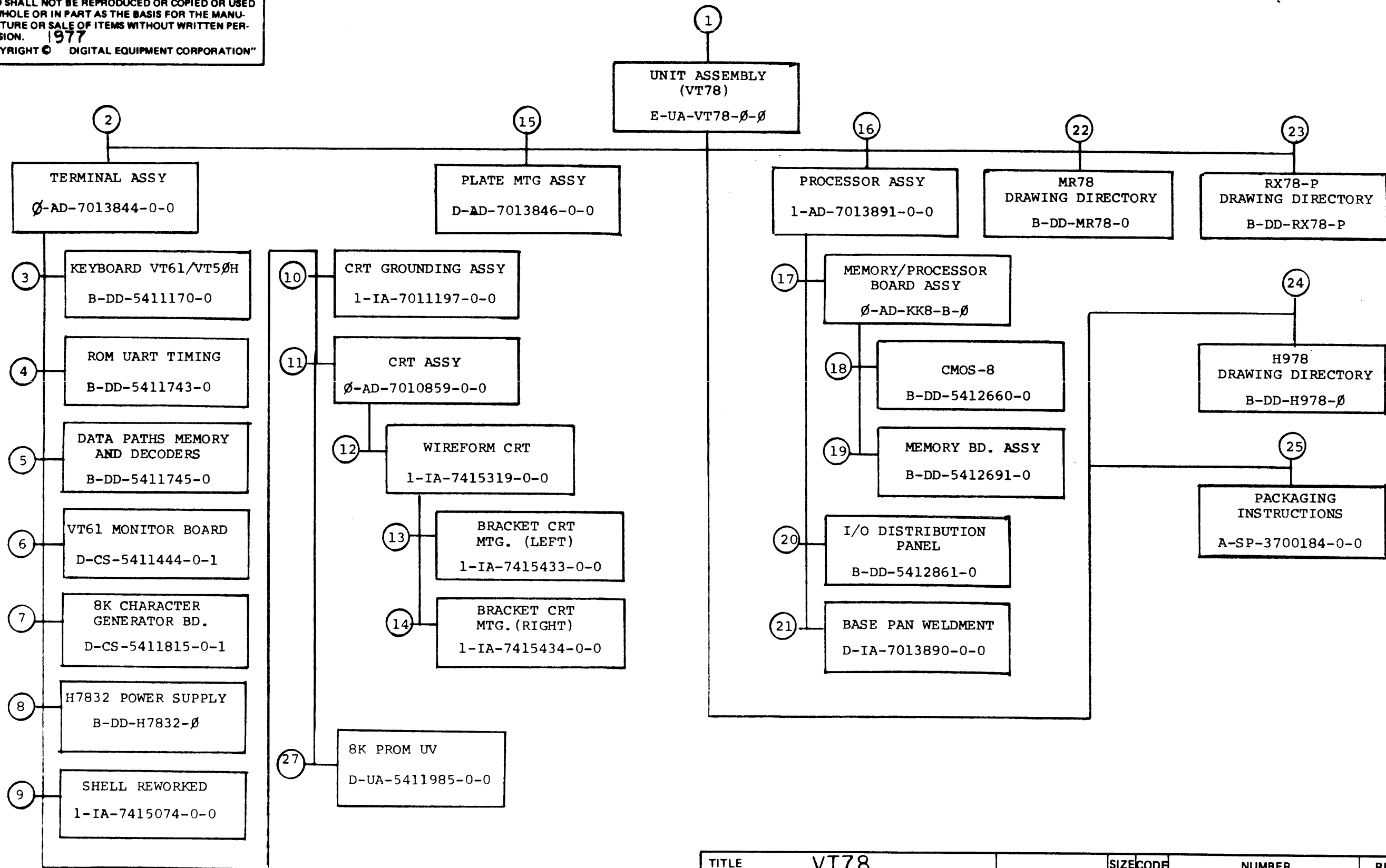
B-TC-VT78-Ø-1	FIELD MAINTENANCE PRINT SET (TC)
B-DD-VT78-Ø	VT78 DRAWING DIRECTORY
E-UA-VT78-Ø-Ø	UNIT ASSY (VT78)
C-PL-VT78-0-5	VT78 FAMILY (CONFIGURATION LIST)
Ø-AD-7013844-Ø-Ø	TERMINAL ASSY
C-PL-7013844-Ø-Ø	TERMINAL ASSY (PL)
A-PL-VT78-Ø	VT78 SHIPPING LIST
K-SP-VT78-Ø-2	PANROM LISTING (23003G1)
K-SP-VT78-Ø-3	PANROM LISTING (23001G1)
K-SP-VT78-Ø-4	PANROM LISTING (23005G1)
1-AD-7013891-0-0	PROCESSOR ASSY
E-UA-5412660-0-0	CMOS 8 UNIT ASSY (SHEET 1 ONLY)
B-PL-5412660-0-0	CMOS 8 (PL)
D-CS-5412660-0-1	CMOS 8
D-UA-5412691-0-0	BOARD, MEMORY UNIT ASSY (SHEET 1 ONLY)
B-PL-5412691-0-0	BOARD, MEMORY (PL)
D-CS-5412691-0-1	BOARD, MEMORY
D-UA-5412861-0-0	BOARD, I/O DISTRIBUTION UNIT ASSY (SHEET 1 ONLY)
B-PL-5412861-0-0	BOARD, I/O DISTRIBUTION (PL)
D-CS-5412861-0-1	BOARD, I/O DISTRIBUTION
B-PL-5411170-0-0	KEYBOARD (PL)
D-CS-5411170-0-1	KEYBOARD

UNIT VARIATIONS COVERED BY THIS PRINT SET
VT78-AA
VT78-AB
VT78-BA
VT78-BB
VT78-WA

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B-PL-5411743-0-0	BOARD, R.U.T. (PL)
D-CS-5411743-0-1	BOARD, R.U.T.
B-UA-5411745	BOARD, DATA PATH (UA) (SHEET 1 ONLY)
B-PL-5411745-0-0	BOARD, DATA PATH (PL)
D-CS-5411745-0-1	BOARD, DATA PATH
D-CS-5411815-0-1	BOARD, CHARACTER GENERATOR
D-CS-5411444-0-1	BOARD, MONITOR
Ø-UA-H7832-Ø-Ø	POWER SUPPLY UNIT ASSY
D-UA-5412973-0-0	POWER SUPPLY UNIT ASSY (SHEET 1 ONLY)
B-PL-5412973-0-0	POWER SUPPLY (PL)
D-CS-5412973-0-1	POWER SUPPLY
D-UA-H978-Ø-Ø	TERMINAL STAND
MPØØ469	RX78-P PRINT SET (MP)
MPØØ552	MR78 PRINT SET (MP)
MPØØ71Ø	DP78 PRINT SET (MP)
A-SP-3700184-0-0	PACKAGING INSTRUCTIONS
B-PL-5411985-0-0	8K PROM UV
E-UA-5411985-0-0	8K PROM UV
D-CS-5411985-0-1	8K PROM UV

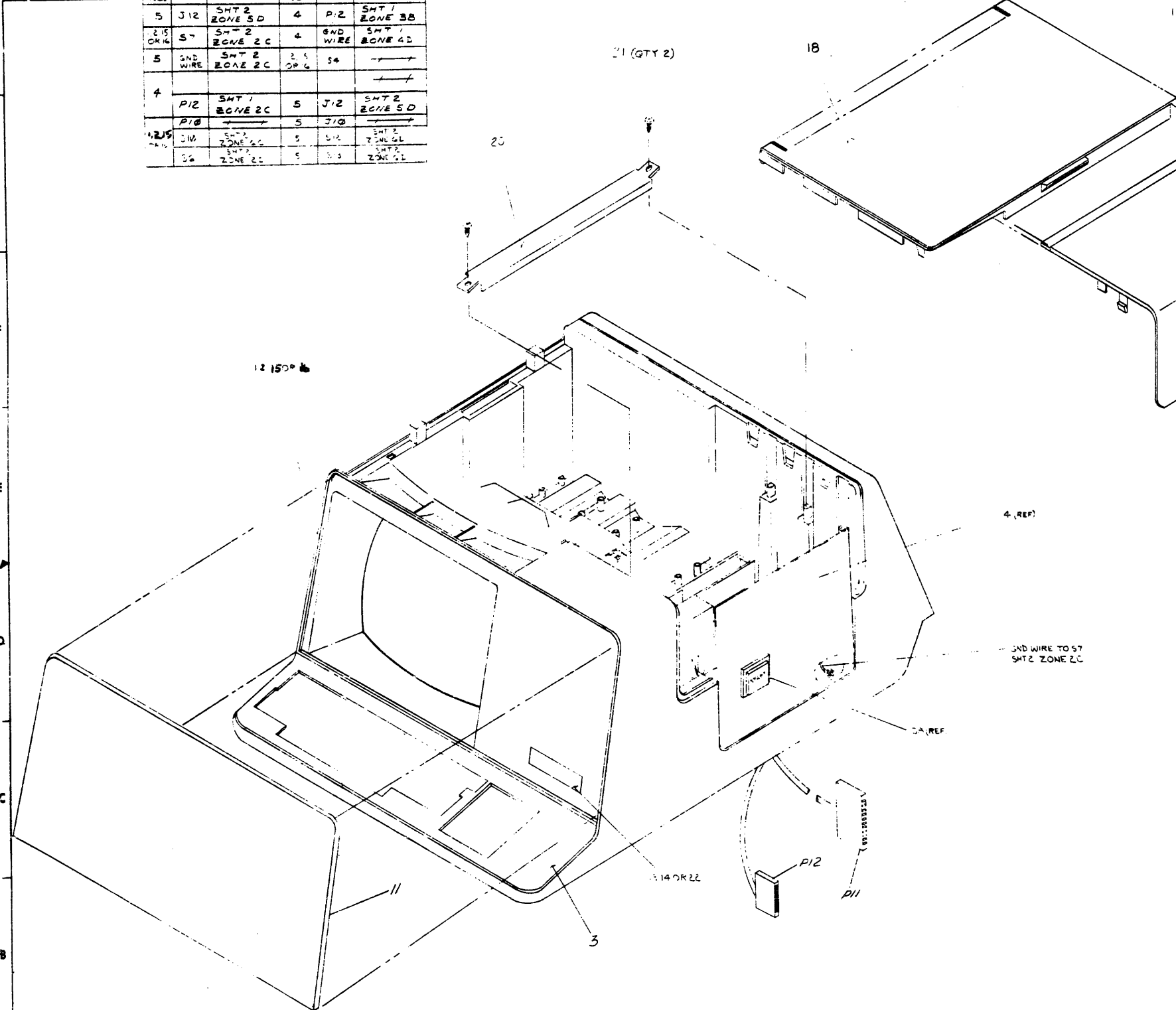
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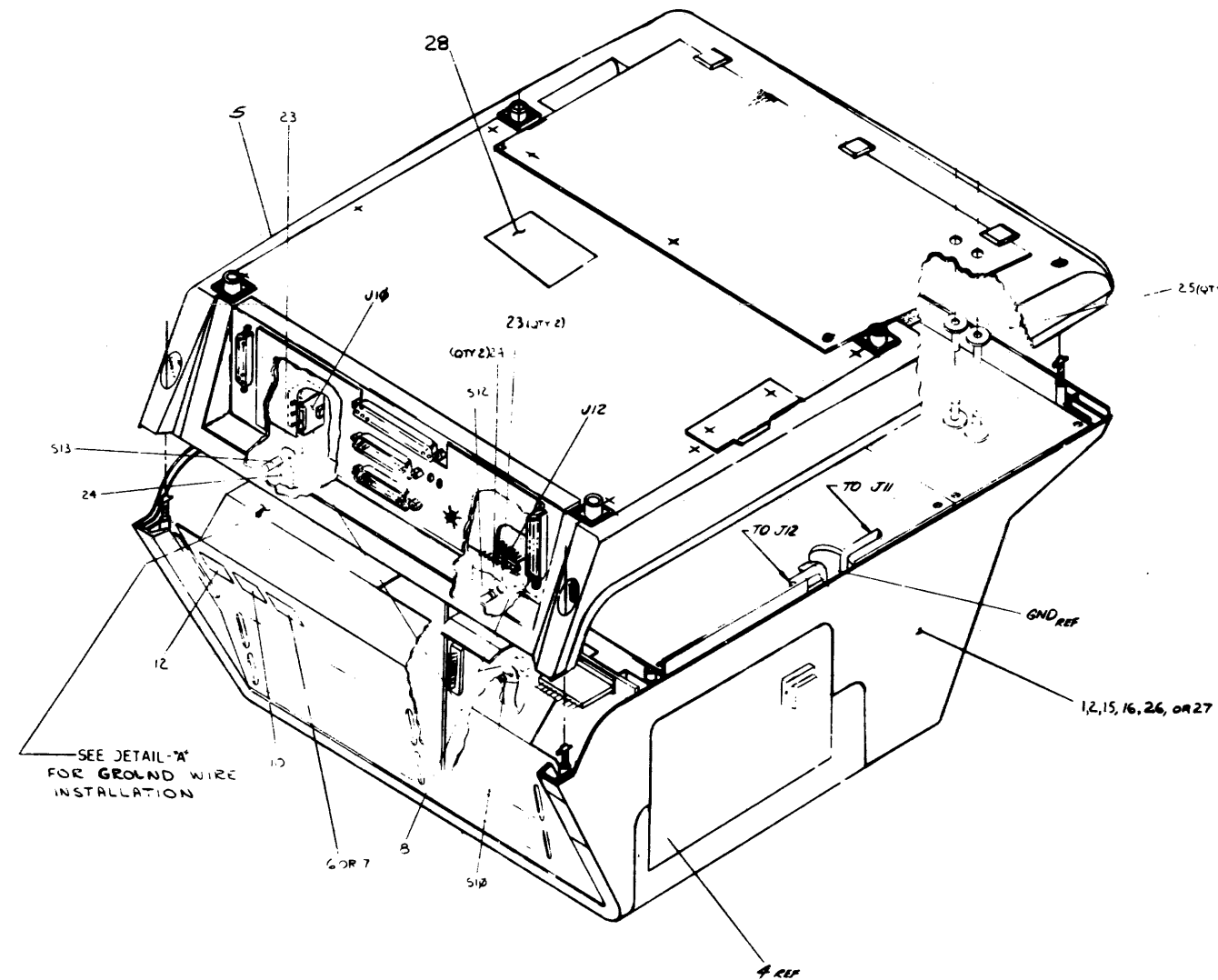
WIRE TABLE					
FROM			TO		
ITEM NO.	CONN	REMARKS	ITEM NO.	CONN	REMARKS
5	J12	SMT 2 ZONE 5D	4	P12	SMT 1 ZONE 3B
215	S7	SMT 2 ZONE 2C	4	END WIRE	SMT 1 ZONE 4D
5	END WIRE	SMT 2 ZONE 2C	215	S7	SMT 2 ZONE 2C
4	P12	SMT 1 ZONE 2C	5	J12	SMT 2 ZONE 5D
215	S7	SMT 2 ZONE 2C	5	J12	SMT 2 ZONE 5D
215	S7	SMT 2 ZONE 2C	5	J12	SMT 2 ZONE 5D

NOTES:
1. REF. TO E-DD-VT78-9 DRAWING DIRECTORY.

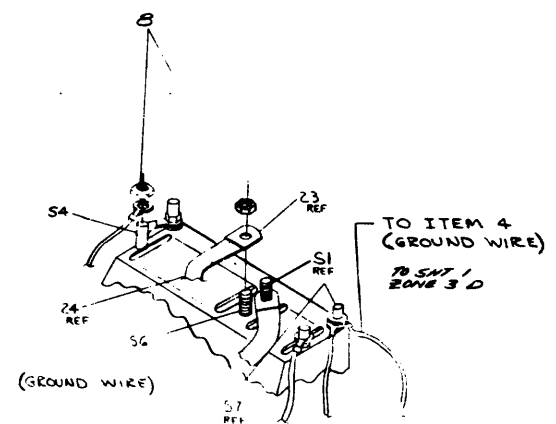


11	0	0	0	0</
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1. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
2. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.
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7. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.
8. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.



SEE DETAIL "A"
FOR GROUND WIRE
INSTALLATION



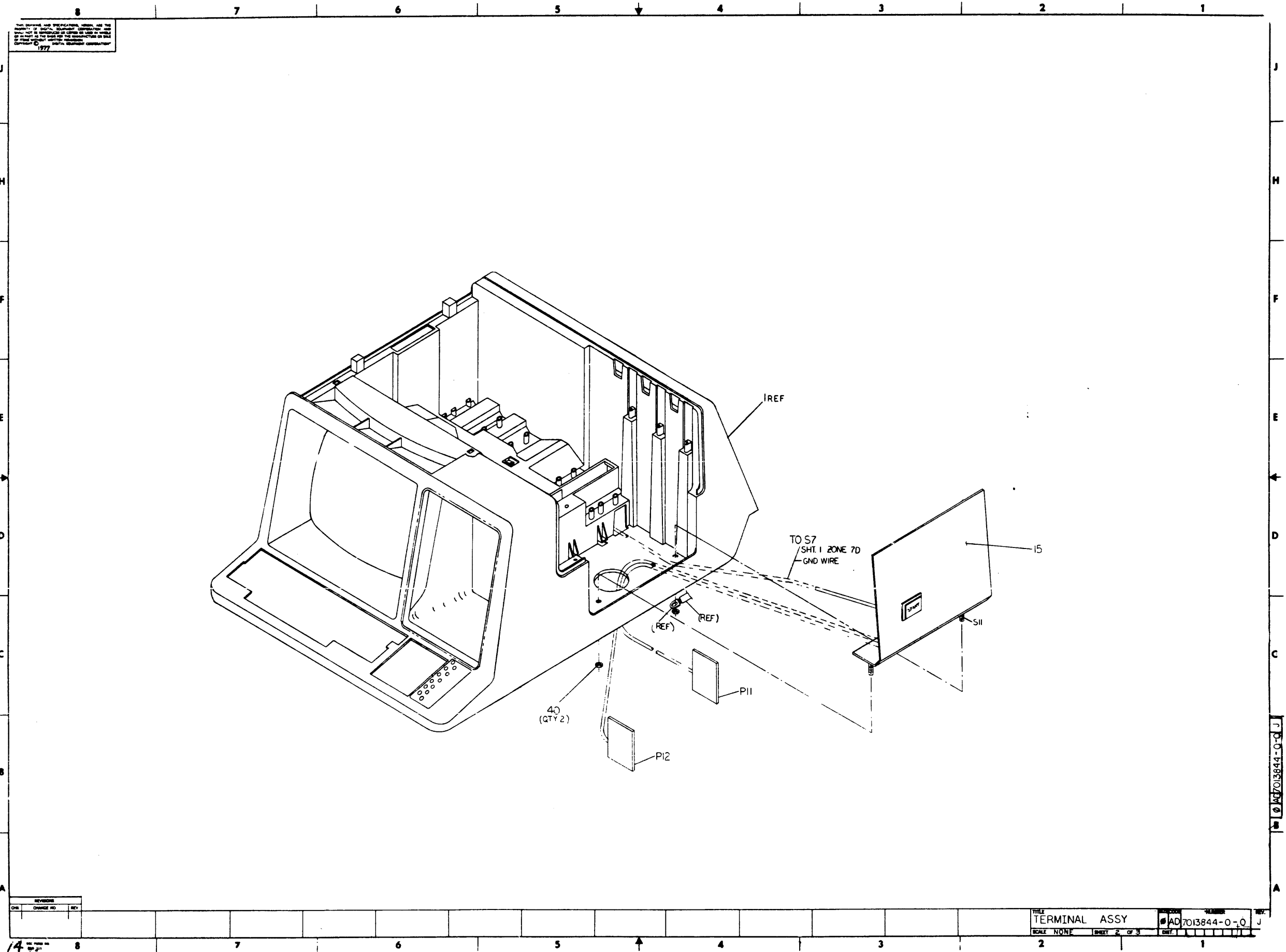
DETAIL - "A"

REF TO SHEET 1 E-UA-VT78-0-0 10/29/79

REV	DATE	BY	CHK
1			

TITLE	UNIT ASSEMBLY VT 78	QTY	1	REV	D
SCALE	1/2" = 1"	SHEET	2	OF	2

E-UA-VT78-0-0 D



THIS DRAWING AND SPECIFICATIONS, WHEN USED IN CONNECTION WITH THE INSTRUCTIONS, SHALL BE HELD AS A CONTRACT DOCUMENT. ANY CHANGES TO THIS DRAWING SHALL BE MADE BY THE ISSUING OFFICE. THE USER SHALL BE RESPONSIBLE FOR THE PROPER USE OF THIS DRAWING. 1977

REVISIONS		
CHG	CHANGE NO	REV

TITLE		TERMINAL ASSY		DRAWING NO.		AD 7013844-0-0		REV.		J	
SCALE		NONE		SHEET		2 OF 3		DATE			

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS PARTS LIST					QUANTITY VARIATION												
MADE BY <i>C. De arpin</i>		CHECKED <i>David 3op/</i>		SECTION		VT78-AA	VT78-AB	VT78-BA	VT78-BB	VT78-WA	VT78-WB	VT78-WC	VT78-WD				
DATE <i>21 DEC 77</i>		DATE <i>3/14/78</i>		1													
ENG <i>David 3op/</i>		PROD <i>John 3op/</i>		ISSUED SECT.													
DATE <i>14-MAR-78</i>		DATE <i>3/14/78</i>		1													
ITEM NO.	DWG NO./PART NO.	DESCRIPTION															
1	MP00468	VT78 FIELD MAINTENANCE PRINT SET				*	*	*	*	*	*	*	*				
2	EK-VTX78-UG-001	DEC STATION USER'S GUIDE				1	1	1	1	1	1	1	1				
3	EK-VTX78-TM-001	TECH. MANUAL				1	1	1	1	1	1	1	1				
4	ZF014-RZ	VT78-Ø DIAGNOSTIC KIT (DOCUMENTS ONLY)				*	*	*	*	*	*	*	*				
5	ZF014-RY	VT78-Ø DIAGNOSTIC KIT (DOCUMENTS & FLOPPY)				1	1	1	1	1	1	1	1				
6	ZF014-PY	VT78-Ø DIAGNOSTIC KIT (FLOPPY ONLY)				*	*	*	*	*	*	*	*				
7	ZF014-PB	VT78-Ø DIAGNOSTIC KIT (PAPER TAPE ONLY)				*	*										

		FIRST USED ON OPTION MODEL		DIGITAL EQUIPMENT CORPORATION	
		KK8-B		MAYNARD, MASSACHUSETTS	
REV	DATE	BY	DATE		
1	14-APR-78	DAVID ZOFF	14-APR-78		
2	14-APR-78	DAVID ZOFF	14-APR-78		
3	14-APR-78	JOHN KIRK	14-APR-78		
4	14-APR-78	JOHN KIRK	14-APR-78		
5	14-APR-78	JOHN KIRK	14-APR-78		
6	14-APR-78	JOHN KIRK	14-APR-78		
7	14-APR-78	JOHN KIRK	14-APR-78		
8	14-APR-78	JOHN KIRK	14-APR-78		
9	14-APR-78	JOHN KIRK	14-APR-78		
10	14-APR-78	JOHN KIRK	14-APR-78		
11	14-APR-78	JOHN KIRK	14-APR-78		
12	14-APR-78	JOHN KIRK	14-APR-78		
13	14-APR-78	JOHN KIRK	14-APR-78		
14	14-APR-78	JOHN KIRK	14		

```
48 /RX01 FLOPPY DISK IOTS
49
50 LCD=6751 /LOAD COMMAND REGISTER
51 XDR=6752 /TRANSFER DATA REGISTER
52 STR=6753 /SKIP ON TRANSFER REQUEST, CLEAR FLAG
53 SER=6754 /SKIP ON ERROR FLAG, CLEAR FLAG
54 SDN=6755 /SKIP ON DONE FLAG, CLEAR FLAG
55 INIT=6757 /INITIALIZE RX01, RECALIBRATE DRIVES
56
57 NOPUNCH
58 *0 /TEMPORARIES IN PANEL READ-WRITE MEMORY
59 *0000 ORIGIN, 0 /POINTER TO MAIN MEMORY
60 *0001 PSTAT, 0 /PANEL STATUS WORD
61 *0002 ACSAV, 0
62 *5 / **** DON'T CHANGE--DEFINES BAUD RATE CONSTANT ALSO ****
63 *0005 STATUS, 0 /FLAGS--LINK, INT BUS, INT ENA, I.F., D.F.
64
65 /AUTO INDEX LOCATIONS ARE 10-17
66
67 *20
68 *0020 FLDCHG, 0 /ENTRY TO FIELD CHANGE SUBROUTINE
69 *0021 MEMFLD, 0 /CDF OR CDF INSTRUCTION GOES HERE
70 *0022 RAREA=
71 /THIS AREA IS FILLED FROM ROM WITH SUBROUTINE LINKS AND CONSTANTS
72 / (SEE PAGE 9)
73
74 *70 /NOW FOR SOME VARIABLE STORAGE
75 *0070 CHAR, 0
76 *0071 PCOUNT, 0
77 *0072 WORD1, 0
78 *0073 WORD2, 0
79 *0074 CKSUM, 0
80 *0075 CKSUM, 0
81 *0076 OTEMP, 0
82 *0077 OCTR, 0
83 *0078 DELAY1, 0
84 *6000 ENPUNCH
85 *6000 CRASH, PER
86 *6001 CRASH, JMP -1
87 *6002 HYPHEN, JMP END3
88 *6003 START, JMP BOOT
89
90
91
92
93
94
95
96
97
98
99
100
101
```

DIGITAL EQUIPMENT CORPORATION		TITLE		K8-B		ISIZE CODE		NUMBER		REV	
MAYNARD, MASSACHUSETTS				PANEL MEMORY CODE							


```
392 00060* 7024 UNIT, 7024 /"UNIT" EQUALS 7004 OR 7024
393 00061* 6030 X6030, 6030 /YE MAGIC CONSTANT
394 RELOC 6374
395 /START-UP STUFF. FILL PANEL R/W MEMORY WITH SUB LINKS AND CONSTANTS.
396
397 06374 0000 ZBLOCK 6400-.
398 0000 *6400
399 06400 7733 KRELSZ, -OFFSET
400 06401 0021 KRAREA, RAREA-1
401 06402 6402 PZREL, .
402
403 0022 RELOC RAREA
404
405 /JUST A REMINDER--
406 /*20
407 /FLOCHG, 0 /ENTRY TO FIELD CHANGE SUBROUTINE
408 /MEMFLD, 0 /BECOMES CDF OR CDF CIF
409 /THIS NEXT STUFF GETS MOVED ONTO PANEL PAGE 0
410
411 /////////////// PANEL PAGE 0 SUBROUTINE LINKS AND CONSTANTS ///////////////
412 JMP I FLOCHG
413
414 00022* 5420
415
416 00023* 0000 MOVE, 0 /COLLECT ARGUMENTS FOLLOWING CALL. MOVE CODE TO
417 00024* 5425 JMP I .+1 /FIELD 0, THEN START THE CODE.
418 00025* 6573 MOVE1
419
420 00026* 0000 TYPE, 0 /TYPE THE CHARACTER IN THE AC, RETURN WITH 0 AC
421 00027* 5430 JMP I .+1 /LINK PRESERVED
422 00030* 6616 TYPE1
423
424 00031* 0000 CRLF, 0 /TYPE A CARRIAGE RETURN AND LINE FEED
425 00032* 5433 JMP I .+1 /AC IGNORED, RETURNS 0. LINK PRESERVED.
426 00033* 6171 CRLF1
427
428 00034* 0000 OCTPNT, 0 /TYPE THE CONTENTS OF THE AC AS OCTAL DIGITS
429 00035* 5436 JMP I .+1 /CAUTION--LINK MODIFIED
430 00036* 6623 OCTPN1
431
432 00037* 0000 MSG, 0 /PRINT THE TEXT STRING FOLLOWING THE CALL
433 00040* 5441 JMP I .+1 /AC MUST BE 0 AT CALL, RETURNS 0. LINK PRESERVED.
434 00041* 6644 MSG1
435
436 00042* 0000 PCHAR, 0 /CONVERT SIX-BIT CHAR TO ASCII AND TYPE
437 00043* 5444 JMP I .+1 /ENTER WITH CHAR IN AC. RETURNS 0 AC,
438 00044* 6656 PCHAR1 /PRESERVED LINK
439
440 00045* 0000 PCPNT, 0 /PRINT FLAGS, PC, AC, MQ
441 00046* 5447 JMP I .+1 /ENTER WITH 0 AC. RETURNS 0 AC, LINK MODIFIED.
442 
```

```
494 06515 1251 CPROM, TAD PK6000 /NOW TRY A CHECKSUM ON THIS ROM.
495 06516 3000 DCA ORIGIN
496 06517 1400 TAD I ORIGIN
497 06520 2000 ISZ ORIGIN
498 06521 5317 JMP -2
499 06522 7440 SZA /CKSUM2 IS SUCH THAT RESULT BETTER BE 0
500 06523 5651 JMP I PK6000 /IT ISN'T--TURN OFF "OK" LIGHT.
501 06524 1202 TAD P2REL /MOVE PANEL PAGE 0 INTO PLACE
502 06525 3010 PAGE0, DCA 10
503 06526 1201 TAD KRAREA
504 06527 3011 DCA 11
505 06530 1200 TAD KRELSZ
506 06531 3012 DCA 12
507 06532 1410 TAD I 10
508 06533 3411 DCA I 11
509 06534 2012 ISZ 12
510 06535 5332 JMP -3
511 06536 7004 LAS
512 06537 7004 RAL
513 06540 7710 SPA CLA
514 06541 5266 JMP APT
515 06542 7344 STA CLL RAL
516 06543 6313 TSBI
517 06544 6333 TSBI
518 06545 6201 MMFLD0, CDF 0
519 06546 7240 STA
520 06547 3010 DCA 10
521 06550 1000 TAD ORIGIN
522 06551 3410 DCA I 10
523 06552 2000 ISZ ORIGIN
524 06553 5350 JMP -3
525 06554 1410 FLD0CK, TAD I 10
526 06555 7041 CIA
527 06556 1000 TAD ORIGIN
528 06557 7440 SZA
529 06560 5255 JMP MMERR
530 06561 2000 ISZ ORIGIN
531 06562 5354 JMP FLD0CK
532 06563 4031 JMS CRLF
533 06564 4037 JMS MSG
534 06565 0100 TEXT AA8
535 06566 4023 JMS MOVE
536 06567 6672 STDIA0-1
537 06570 0065 DIAG-1
538 06571 6706 DIAG-LAST
539 
```

```
0606 06666 7700 PM100, -100
0607 06667 7774 PM4, -4
0608 06670 0077 PK77, 77
0609 06671 0240 PK240, 240
0610 06672 0260 PK260, 260
0611
0612
0613 0066 DIAG=66 /CHANGE WITH CAUTION!! WATCH PAGE BOUNDARIES.
0614
0615 /SOME PAGE ZERO VARIABLES AND FUNNY OPERATES FOR OPRATE AND MRI TESTS
0616 MONOP=7401
0617 MQLA=7601 /THE FOLLOWING RESIDE IN PAGE 0, FIELD 0 OF MAIN MEMORY
0618 0020 REGA=20
0619 0021 REGB=21
0620 0022 A=22
0621 0023 B=23
0622 0024 C=24
0623 0026 KLTRS=26
0624 0025 D=25
0625
0626 6673 3DDIAG=. /START OF THE DIAGNOSTIC STUFF
0627 0066 RELOC DIAG
0628
0629
0630
0631
0632 00066* 7402
0633 00067* 0067 HLT
0634 00070* 7745 ESCSEQ, -33
0635 00071* 7735 -43
0636 00072* 7740 /SEQ IS ESC--NBR SIGN--SPACE--0
0637 00073* 7720 /NOTICE--NO "200" BIT
0638 00074* 0007 7 /ALSO TERMINATES ESCAPE LIST BECAUSE IT'S +
0639 00075* 0100 /CONSTANTS
0640 00076* 7401 M7700, -7700
0641 00077* 7750 M30, -30
0642 00100* 7765 M13, -13
0643 00101* 7772 M6, -6
0644 00102* 0010 K10, 10
0645 00103* 0011 K11, 11
0646 00104* 0077 K77, 77
0647 00105* 0200 K200, 200
0648 00106* 0300 K300, 300
0649 00107* 7400 K7400, 7400
0650 00110* 7700 K7700, 7700
0651 00111* 0374 PADIP, TAD1
0652 00112* 0710 XADDP, XTDADD
0653 00113* 1032 XINP2, KHLT+1
0654 00114* 5515 INIJMP, JMP I INTLNK
0655 00115* 0613 INILNK, INT
```

```
718 00211* 7402 HLT /DID THAT CLA BIT ABOVE REALLY CLEAR THE AC??
719 00212* 7001 IAC
720 00213* 7760 SZA SZA SNL CLA
721 00214* 7440 SZA
722 00215* 7402 HLT /CLA DID NOT WORK??
723
724 00216* 7360 RUNIR, CLA CLL CMA CML /COMBINED INCREMENT AND ROTATE TEST
725 00217* 7367 CLA CLL CMA CML IAC RTL /AC, LINK BOTH 0
726 00220* 7420 SNL
727 00221* 7440 SZA /IAC OR ROTATE FAILED
728 00222* 7402 HLT
729 00223* 7060 CMA CML /IAC OR ROTATE FAILED
730 00224* 7373 CLA CLL CMA CML IAC RTR /AC, LINK BOTH 0
731 00225* 7420 SNL
732 00226* 7440 SZA
733 00227* 7402 HLT /IAC OR ROTATE FAILED
734 00230* 3020 DCA REGA
735 00231* 1020 TAD REGA
736 00232* 7165 CLL CML CMA IAC RAL
737 00233* 7010 RAR
738 00234* 7073 CML CMA IAC RTR
739 00235* 7006 RTL
740 00236* 7071 CML CMA IAC RAR
741 00237* 7004 RAL
742 00240* 7067 CML CMA IAC RTL
743 00241* 7012 RTR
744 00242* 7041 CIA
745 00243* 1020 TAD REGA
746 00244* 7430 SZL
747 00245* 7440 SZA
748 00246* 7402 HLT /COMBINED IAC, ROTATE DID NOT WORK
749 00247* 2020 ISZ REGA
750 00250* 5231 JMP RUNRT
751
752 00251* 1020 RUNMQBS, TAD REGA
753 00252* 7106 RTL CLL
754 00253* 7006 RTL /SIMULATE BSW
755 00254* 7006 RTL
756 00255* 0110 AND K7700
757 00256* 3021 DCA REGB
758 00257* 1020 TAD REGA
759 00260* 7112 RTR CLL
760 00261* 7012 RTR
761 00262* 7012 RTR
762 00263* 0104 AND K77
763
```

/JUST PUT AN EFFECTIVE JMP I (TADTST AT JMTST
/THEN START RUNNING AT OR BEFORE TADTST.
/MACHINE WILL THEN RUN THE AND-TAD TESTS UNTIL HALTED.

/HERE'S THE REAL MEAT OF THE PROGRAM. R2
/PLUS COUNT

/MINUS (R2+COUNT)
/SHOULD BE ZERO
/TAD TEST FAILURE
/BUMP (R2+COUNT)

/BUMP COUNT
/AND BACK WE GO

/PARTIAL "AND" SIMULATION OF PREVIOUS TAD TEST
/R2
/TO D

/R2 "AND" C

/*2
/TO "A" [CARRY IS GENERATED ONLY ON 1+1]
/THE NEXT BUNCH OF CODE

/FORMS THE XOR OF R2 AND "C"

/IN THE ACCUMULATOR, PERFORMING A HALF-ADD
/ADD IN CARRY ---> RESULT IN AC

/RESULT SHOULD EQUAL D

/AND TEST FAILURE

/TEST JMS INSTRUCTION
/BUFFER SIZE (CANNOT EXCEED ONE PAGE)

/START OF BUFFER--MUST BE START OF PAGE

830 00365* 7001 IAC R1
831 00366* 3126 DCA R1
832 00367* 1127 TAD R2
833 00370* 1126 TAD R1
834 00371* 3127 DCA R2
835 00372* 1127 TAD R2
836 00373* 3025 DCA D
837 00374* 1127 TAD R2
838 00375* 1024 TAD C
839 00376* 7041 CMA IAC
840 00377* 1025 TAD D
841 00400* 7440 SZA
842 00401* 7402 HLT
843 00402* 2025 ISZ D
844 00403* 7000 NOP
845 00404* 2024 ISZ C
846 00405* 5511 JMP I TADLP
847
848
849

```
942 /TEST THE 3 SERIAL LINE UNITS BY LOOPING BACK AND SENDING ALL POSSIBLE
943 /CHARACTERS. USE INTERRUPT SYSTEM.
944 ISZ REGA /WAIT FOR ANY IN-PROCESS CHARACTER TO TRANSMIT
945 JMP -1
946 STA CLL RAL
947 TSB /4 LSB = 16--SET SLU1 TO 9600 9AUD, SO THE SLU TEST
948 /CLEAR THE ONLY TWO FLAGS WHICH COULD
949 /CAUSE AN INTERRUPT. ALSO CLEAR AC.
950 TAD MODE2
951 KLB /SET UP LOOPBACK (WORKS BECAUSE AC 11 = 1)
952 /SET UP 8-BIT ASCII MODE ON LINE 2
953 /ANYTHING ON THE INTERRUPT BUS??
954 SRQ CLA
955 /YES--WE GOT TROUBLE!
956 /SET UP INTERRUPT JMP = JMP I (INTCHN
957 /CREATE A BUFFER CONSISTING OF 8-BIT CHARACTERS
958 /1,2,3,4,----376,377,0
959
960 /FILL LAST CHARACTER
961 /SET UP 6 AUTO INDEX REGISTERS SO THEY ALL
962 /POINT TO FIRST WORD OF BUFFER
963
964
965
966
967
968
969
970
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972
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975
976
977
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	DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS	TITLE	KK8-B PANEL MEMORY CODE	ISIZE CODE	NUMBER	REV
1					VT78-0-2	*

```
998 JMP NULL
999 IAC CLL RAL
1000 MQL /INDICATE SLU 2 DONE (IF SLU 3 GOOD, TEST COMPLETES)
1001 TAD TLIMIT
1002 TAD 15
1003 SZA CLA
1004 /SLU3 DONE?
1005 JMF NULL
1006 /JOB DONE--CLEAR LOOPBACK FF
1007 /RESET TERMINAL BAUD RATE, PER AC2
1008 RCL
1009 SNA CLA
1010 /IF AC2 WAS 0, MAKE BAUD RATE 9600
1011 TAD K
```


FLOPCK 6554
FLOPPY 6331
FLOPPY 1044
TERMIN 1140
TERMI0 1134
TERMI1 1144
TERMOU 1146
TERMO1 1130
TLIMIT 0117
TLN1 0647
TLN2 0654
TLN3 0661
TLS1 6316
TLS2 6336
TSB 6043
TSB1 6313
TS32 6333
TSF1 6311
TSF2 6331
TTYBUF 0120
TYPE 0026
TYPEIT 0131
TYPE1 6616
UNIT 0060
WORD1 0072
WORD2 0073
XA 1035
XADDP 0112
XCKOUN 0770
XCKGET 0750
XDR 6752
XTDADD 0710
XTDCHK 0742
XTDFIL 0717
XTDFLD 0737
XTNP2 0113
X6030 0061

K11 0103
K200 0105
K300 0106
PK215 5050
PK240 6671
PK255 0061
TRUP 6000
TCP1 6312
TCP2 6332

ERRORS DETECTED: 0
LINKS GENERATED: 0

		TITLE		ISIZEICODE		NUMBER	REV
DIGITAL EQUIPMENT CORPORATION							
MAYNARD, MASSACHUSETTS						VT78-0-2	*
						K SP	
		</					

FLOCHG	58#	122	124	128	253	280	402
FLOCK	525#	531					
FLOPPY	230#	344#					
FLOPY1	1201#	1220					
FLOPY2	1199#	1225					
FLOPY3	1228	1230#					
FMASK	277#	317					
FPYRST	1195#						
FRET	656	1161#					
GO	252#	273					
GOODRD	366	372#					
HALT	631#	1144					
HANGG	348	361#	379				
HLTADR	168	445#					
HLCHK	151	164#					
HLTD1	166	171#	456				
HLTD2	183#	186	328				
HLFLG	161	164	176	189	444#	459	
HLTOK	170	189#					
HYPHEN	87#						
INIT	55#						
INTCHN	655	1017#					
INTJ							

! !	! FIRST USED ON OPTION MODEL	!	DIGITAL EQUIPMENT CORPORATION	!
! !REV!	! KK8-B	!	MAYNARD, MASSACHUSETTS	!
!R! C!	!	!		!
!E! H!	!DRN. DAVID ZOPF !DATE 14-APR-78 !	!		!
!V! A!	!CHK'D DAVID ZOPF !DATE 14-APR-78 !	!TITLE		!
!I! N!	!ENG. JOHN KIRK !DATE 14-APR-78 !	PANEL MEMORY CODE		!
!S! G!	!P.ENG. JOHN KIRK !DATE 14-APR-78 !			!
!O! E!	!PROD. JOE DIENST !DATE 14-APR-78 !	!SIZE!CODE!	NUMBER	!REV!
!N!	!NEXT HIGHER ASSEMBLY	! K ! SP !	VT78-0-3	! *
! !CHK!	! 54-12660 !DIST.!	!	!	!
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331	06335	6321	BOOT2	
332	06336	7402	HLT	
333				
334	06337	7126	PFLBT,	/YE FLOPPIE BOOTSTRAP--LOCATION 24, FLD 0
335	06340	1060	1060	
336	06341	6751	6751	
337	06342	7201	7201	/LOC 30
338	06343	4053	4053	
339	06344	4053	4053	/YE BOOTSTRAPPE STARTE
340	06345	7104	7104	
341	06346	6755	FLPYST,	
342	06347	5054	5054	
343	06350	6754	6754	/LOC 40
344	06351	7450	7450	
345	06352	7610	7610	
346	06353	5046	5046	
347	06354	1060	1060	
348	06355	7041	7041	
349	06356	1061	1061	
350	06357	3060	3060	
351	06360	5024	5024	
352	06361	6751	6751	/LOC 50
353	06362	4053	4053	
354	06363	3002	3002	
355	06364	2050	2050	


```
1243 01143* 5316 JMP TERM01
1244
1245 01144* 6073 ESCAPE, PRQ /TRAP BACK TO THE BOOTSTRAP IN PANEL MEM
1246 01145* 6003
1247
1248 1146 LAST=.
1249 7757 RELOC
1250 07757 0000 2BLOC 7776-.
1251 7776 *7776
1252 07776 6004 PANEL
1253 07777 5776 JMP I .-1 /JUMP TO THE START OF EVERYTHING
1254 /PANEL REQUESTS START EXECUTING CODE HERE
1255
1256
```

```

A 0022 FLPYST 6346 K7700 0107 PRS 6071
ACSAV 0082 FMASK 6241 LAST 1146 PST 6072
ANDTST 0405 FPYTST 1024 MEMERR 0752 PSTART 6254
APT 6404 FRET 0775 MEMFLD 0021 PSTAR1 6260
AVA 0446 GO 6212 MMER 6556 PSTAR2 0064
AUB 0452 HALT 0066 MMERR 6453 PSTAT 0001
AUC 0457 HLTADR 0062 MMFLD0 6543 PZREL 6402
AUD 0461 HLTCHK 0064 MODE2 0123 RAREA 0022
AUE 0470 HLTDL 6073 MOVE 0023 REGA 0020
AUG 0474 HLTDL2 6103 MOVE1 6571 REGB 0021
AUTO 0017 HLTOK 6163 MOCLA 7601 RESESC 1114
B 0023 HYPHEN 0002 MONOP 7401 RETUR 0465
BADRD 6305 INTCHN 0601 MSG 0037 RLN1 0654
BEGG 0054 INTJMP 0113 MSG1 0037 RLN2 0662
BEGG1 6263 INTLNK 0114 M13 0100 RLN3 0670
BEGIN 6281 INTOFF 6333 M30 0077 RNM0BS 0250
BEND 6243 JMPXA 1022 M377 0076 ROMSUM 5667
BOOT 6114 JMS*ST 0
```


TLN3 1002 1021#
TLS1 902# 1016 1233
TLS2 910# 1022
TSB 26# 90
TSB1 318 489 901# 1227
TSB2 490 909#
TSF1 899# 997 1231
TSF2 907# 1000
TTYBUF 633# 928 942
TYPE 177 190 208 210 385# 542 551 559 581
TYPEIT 642# 649 655 885 977 1151 1208
TYPE1 387 534#
WORD1 67# 237 244 252 262 537 538
WORD2 68# 241 248 253 264
XA 1150 1151#
XADDP 627# 978
XCKDUN 1096 1104#
XCKGET 1086# 1093 1097
XTDADD 627 1052#
XTDCHK 1066 1080#
XTDFIL 1059# 1063 1067
XTDFLD 1074 1075 1076# 1084
XTNP2 628# 1139

V3

DIGITAL EQUIPMENT CORPORATION	TITLE	SIZE	CODE	NUMBER	REV
MAYNARD, MASSACHUSETTS	KK8-B PANEL MEMORY CODE	K	SP	VT78-0-3	*


```
1      /KK8-B PANEL MEMORY CODE 23-005G1-00
2      /D.A.WHITE      21-SEP-77
3      /D.L.RIIKONEN   27-MAR-78, RENAMED TO 005G1 25-APR-78
4      /B.E.MEACHAM    12-1-78, FORMAT REVISIONS TO 005G1 25-APR-78
5      /ASSEMBLE THIS FILE WITH PANROM.BI--THIS MAKES THE ROM CHECKSUM
6      /COME OUT CORRECTLY.
7
8      3020 ROMSUM=3020
9      6073 PRQ=6073      /MAKE PANEL REQUEST
10     /IMPORTANT ROUTINES, CALLED BY THE GENERAL CALL
11     /      PRQ
12     /      ADDRESS
13     /THESE ADDRESSES SHOULD REMAIN FIXED, DESPITE REVISIONS:
14     /BEGIN=6201--RUN MR78 LOADER. SR0 NOT TESTED.
15     //(INTERRUPT SHOULD BE OFF, OR CAF SHOULD BE FIRST INSTRUCTION EXECUTED IN MAIN
16     /RX01=6200--BOOTSTRAP RX01 (INTERRUPT MUST BE OFF, OR CAF FIRST INSTRUCTION
17     //EXECUTED IN MAIN MEMORY.)
18     /START=6003--FLOPPY DISK (RX01) OR MR78, DEPENDING ON MR78 JUMPER.
19     //GIVE "START" MESSAGE
20     /HYPHEN=6002--RETURN TO "DUMB TERMINAL" MODE
21     6071 PRS=6071      /READ PANEL STATUS TO AC 0-3
22     /AC0=STARTUP CONDITION
23     /AC1=BOOTSTRAP BUTTON
24     /AC2=PROGRAM HLT
25     /AC3=PROGRAM REQUEST
26     6072 PST=6072      /COMPLEMENT THE RUN FLIP-FLOP
27     6074 PER=6074      /TURN ERROR LIGHT ON
28     6043 TSB=6043      /SET LOCAL-TERMINAL BAUD RATE PER AC 8-11
29     /SOME MAGIC NUMBERS FOR IOT ABOVE:
30     /      BAUD RATE      AC8-11      BAUD RATE      AC8-11
31     /      50              0              1800          10
32     /      75              1              2000          11
33     /      110             2              2400          12
34     /      134.5           3              3600          13
35     /
36     /      150              4              4800          14
37     /      300              5              7200          15
38     /      600              6              9600          16
39     /      1200             7             19200          17
40     6037 KLB=6037      /SET LOOPBACK IF AC11=1; CLEAR LOOPBACK IF AC11=0
41
42     /LAS INSTRUCTION PICKS UP THE FOLLOWING BITS:
43     /      AC0=1 IF MR78 BOARD INSERTED
44     /      AC1=1 IF APT TEST
45     /      AC2=SELECT LOCAL TERMINAL BAUD RATE (0=9600 BAUD; 1=300 BAUD)
46     /      AC<3:5>=NBR OF MR78 PROGRAMS TO LOAD-1
47     /      AC<6:7>=UNDEFINED (DO NOT ASSUME ANYTHING--MASK OFF IF IN DOUBT)
48     /      AC<8:11>=BAUD RATE (SEE TSB I
```

```
54          6753 STR=6753          /SKIP ON TRANSFER REQUEST, CLEAR FLAG
55          6754 SER=6754          /SKIP ON ERROR FLAG, CLEAR FLAG
56          6755 SDN=6755          /SKIP ON DONE FLAG, CLEAR FLAG
57          6757 INIT=6757         /INITIALIZE RX01, RECALIBRATE DRIVES
58
59          NOPUNCH
60          0000 *0                /TEMPORARIES IN PANEL READ-WRITE MEMORY
61 00000 0000 ORIGIN, 0            /POINTER TO MAIN MEMORY
62 00001 0000 PSTAT, 0            /PANEL STATUS WORD
63 00002 0000 ACSAV, 0
64          0005 *5                / **** DON'T CHANGE--DEFINES BAUD RATE CONSTANT ALSO ****
65 00005 0000 STATUS, 0           /FLAGS--LINK, INT BUS, INT ENA, I.F., D.F.
66
67          /AUTO INDEX LOCATIONS ARE 10-17
68
69          0020 *20
70 00020 0000 FLDCHG, 0           /ENTRY TO FIELD CHANGE SUBROUTINE
71 00021 0000 MEMFLD, 0           /CDF OR CDIF INSTRUCTION GOES HERE
72          0022 RAREA=.
73          /THIS AREA IS FILLED FROM ROM WITH SUBROUTINE LINKS AND CONSTANTS
74          / (SEE PAGE 9)
75          0070 *70
76          /NOW FOR SOME VARIABLE STORAGE
77 00070 0000 CHAR, 0
78 00071 0000 PCOUNT, 0
79 00072 0000 WORD1, 0
80 00073 0000 WORD2, 0
81 00074 0000 CKSUM, 0
82 00075 0000 OTEMP, 0
83 00076 0000 OCTR, 0
84 00077 0000 DELAY1, 0
85          ENPUNCH
86          6000 *6000
87 06000 6074 CRASH, PER          /IN CASE R/W MEMORY GOES BESERK, WE MIGHT "AND"
88 06001 5200 JMP .-1             /UP THRU MEMORY TO HERE. HANG AND TURN OFF "CPU OK" LIGHT
89 06002 5354 HYPHEN, JMP END3
90 06003 5275 START, JMP BOOT
91
92          /////////////////////////////////// PANEL CALL HANDLER ///////////////////////////////////
93 06004 3002 PANEL, DCA ACSAV     /SAVE ALL PERTINENT REGISTERS, SUCH AS AC
94 06005 6004 GTF
95 06006 0303 AND PK7700          /LINK, INT BUS, INT ENABLE
96 06007 3005 DCA STATUS
97 06010 6214 RDF
98 06011 7110 RAR CLL
99 06012 7012 RTR
100 06013 6224 RIF                /INSTRUCTION AND DATA FIELDS
101 06014 1005 TAD STATUS
102 06015 3005 PK05, DCA STATUS    /CONSTANT DEPENDS ON STATUS WORD BEING IN
103 06016 7604 LAS
```



```
162 06105 7001 IAC
163 06106 3063 DCA HLTFLG
164 06107 5465 JMP I KBOOT1
165
166 06110 1063 HLTCHK, TAD HLTFLG
167 06111 7700 SMA CLA /ARE WE TESTING THE HLT INSTRUCTION?
168 06112 5317 JMP HLTD1 /NO--THIS IS A REAL LIVE HALT
169 06113 1000 TAD ORIGIN /YES--MAKE SURE ADDRESS CORRECT
170 06114 1064 TAD HLTADR
171 06115 7650 SNA CLA /COMPARE ORIGIN WITH EXPECTED
172 06116 5334 JMP HLTD1, JMS CRLF /HALT INSTRUCTION WORKED. BACK TO DIAGNOSTIC
173 06117 4031 JMS MSG
174 06120 4037 JMS MSG /PROGRAM HALT--PRINT
175 06121 1014 TEXT %HLT% /THIS MESSAGE,
176 06122 2400
177 06123 4045 JMS PCPNT /AND THE STATE OF THE MACHINE
178 06124 1063 TAD HLTFLG /INITIALLY, HLTFLG = -1 (WHEN PANEL PG 0 IS FILLED)
179 /HENCE THE "SMA CLA" AT HLTCHK+1 SKIPS..
180 /AFTER HLT INSTRUCTION TESTED, HLTFLG=0
181 06125 7750 SNA SPA CLA /HENCE DIAGNOSTIC HLT PRINTS MESSAGE AND RESTARTS
182 06126 5652 JMP I STRT /DIAGNOSTIC. AFTER DIAGNOSTIC, HLTFLG=1 AND THE
183 /"SNA SPA CLA" SKIPS, CAUSING A WAIT FOR BOOTSTRAP
184 /BUTTON.
185 06127 6071 HLTD2, PRS
186 06130 7006 RTL
187 06131 7620 SNL CLA /ONLY THE BOOTSTRAP BUTTON GETS US OUT OF HALT
188 06132 5327 JMP HLTD2 /HANG UNTIL IT IS PUSHED.
189 06133 5275 JMP BOOT
190
191 06134 3063 HLTD2, DCA HLTFLG /HLT INSTRUCTION TESTS OUT OK--BUMP HLTFLG
192 06135 6201 KCDF, CDF 0
193 06136 2000 ISZ ORIGIN / (WILL NEVER SKIP, SINCE ORIGIN=HLTADR)
194 06137 5466 JMP I PSTAR2 /AND GO BACK TO THE REST OF THE DIAGNOSTIC
195
196 ////////////////////////////////////////////////// CHARACTER ECHO TEST, DRAW LINE OF HYPHENS //////////////////////////////////
197 06140 4031 END, JMS CRLF
198 06141 5344 JMP .+3
199 06142 6036 ECHO, KRB /GET CHARACTER
200 06143 4026 JMS TYPE /ECHO IT
201 06144 1062 TAD PM110 /-200 (OCTAL) TO AC
202 06145 3071 D
```

```
216 06163 4031 JMS CRLF
217 06164 4023 JMS MOVE
218 06165 6672 STDIAG-1
219 06166 0065 DIAG-1
220 06167 6677 DIAG-LAST
221 06170 1123 NULJOB /MOVE IN THE ENTIRE DIAGNOSTIC (PERHAPS AGAIN), AND
222 /START AT "NULJOB"
223
224 06171 7200 CRLF1, CLA /TYPE CARRIAGE RETURN AND LINE FEED
225 06172 1250 TAD PK215
226 06173 4026 JMS TYPE
227 06174 1060 TAD PK212
228 06175 4026 JMS TYPE
229 06176 5431 JMP I CRLF
230 06177 0000 ZBLOCK 6200-.
231 6200 *6200
232 06200 5331 RX01, JMP FLOPPY
233
234 //////////////////////////////////// BINARY LOADER FOR MR78 ////////////////////////////////////
235 /WORKS LIKE STANDARD BINARY LOADER, EXCEPT
236 / 1. USES ONLY HIGH-SPEED "PAPER TAPE" INPUT
237 / 2. USES SR3-5 TO DETERMINE HOW MANY PROGRAMS TO LOAD
238 / 3. EXPECTS A FIELD AND ORIGIN STATEMENT AT THE END
239 / OF "TAPE" IN ORDER TO DEFINE START OF PROGRAM.
240 / 4. NO PROVISION FOR RUBOUT.
241 / 5. TAPES MUST BE CONTIGUOUS--NO HALTS (NO CONTINUE BUTTON!!)
242
243 06201 6016 BEGIN, RRB RFC /WE START THE READ THIS WAY SO
244 /THE INTERFACE USES ONLY 2 IOTS
245 06202 7604 LAS / (THROW AWAY FIRST WORD--IT'S ALWAYS L-T)
246 06203 7002 BSW /GET BITS 3-5.
247 06204 0057 AND PK7
248 06205 7040 CMA
249 06206 3071 DCA PCOUNT /COMPLEMENT AND SAVE AS NUMBER OF PGMS TO LOAD
250 06207 6203 KCDIF, CDF CIF /IN CASE NO FIRST FIELD STATEMENT
251 06210 4054 JMS BEGG /CALL LEADER-TRAILER EXTRACT ROUTINE
252 06211 5210 JMP .-1 /AND HANG IN THERE UNTIL PAST LEADER
253
254 06212 3074 GO, DCA CKSUM /CLEAR OR ACCUMULATE CHECKSUM
255 06213 4020 JMS FLDCHG /MAKE SURE FIELD IS UP TO DATE
256 06214 1070 TAD CHAR /GET CHARACTER
257 06215 3072 DCA WORD1 /SAVE AS FIRST CHARACTER
258 06216 6011 RSF /OF A 12-BIT WORD
259 06217 5216 JMP .-1
260 06220 6016 RRB RFC /READ SECOND CHARACTER
261 06221 3073 DCA WORD
```



```
378 00037* 5020      JMP      READ
379
380 00040* 1061      TAD      UNIT      /OR UNIT AND DENSITY WITH COMMAND
381                /DENSITY DETERMINES NUMBER WORDS TRANSFERRED FOR RX02/4 PIO
382 00041* 6751      LCD
383 00042* 1061      TAD      UNIT      /SETUP LOC 60 FOR RX01 SECONDARY BOOT
384 00043* 0046      AND      CON360
385 00044* 1032      TAD      LTERAL
386 00045* 3060      DCA      RX1SAV
387 00046* 0360      CON360, 360      /CONSTANT = 0360 (EXECUTES AS AND)
388 00047* 4053      JMS      LOAD
389 00050* 3002      DCA      2
390 00051* 2050      ISZ      50
391 00052* 5047      JMP      47
392
393 00053* 0000      LOAD, 0
394 00054* 6753      STR
395 00055* 5033      JMP      STRXBT
396 00056* 6752      XDR
397 00057* 5453      JMP      I LOAD
398
399                CON420,      /CONSTANT = 0420
400 00060* 0420      RX1SAV, 0420 /LINK WITH RX01 SECONDARY BOOT
401 00061* 0020      UNIT, 0020  /LINK WITH RX02/4 SECONDARY BOOT
402                /SPECIFIES DENSITY AND UNIT
403
404                6400 RELOC
405                /START-UP STUFF.  FILL PANEL R/W MEMORY WITH SUB LINKS AND CONSTANTS.
406
407                ZBLOCK 6400-.
408                6400 *6400
409 06400 7733 KRELSZ, -OFFSET
410 06401 0021 KRAREA, RAREA-1
411 06402 6402 PZREL, .
412
413                0022 RELOC RAREA
414
415                /JUST A REMINDER--
416                /*20
417                /FLDCHG, 0      /ENTRY TO FIELD CHANGE SUBROUTINE
418                /MEMFLD, 0      /BECOMES CDF OR CDF CIF
419                /THIS NEXT STUFF GETS MOVED ONTO PANEL PAGE 0
420
421                /////////// PANEL PAGE 0 SUBROUTINE LINKS AND CONSTANTS ///////////
422 00022* 5420      JMP I FLDCHG
423
424 00023* 0000      MOVE, 0      /COLLECT ARGUMENTS FOLLOWING CALL.  MOVE CODE TO
425 00024* 5425      JMP I .+1    /FIELD 0, THEN START THE CODE.
426 00025* 6573      MOVE1
427
428 00026* 0000      TYPE, 0      /TYPE THE CHARACTER IN THE AC, RETURN WITH 0 AC
429 00027* 5430      JMP I .+1    /LINK PRESERVED
430 00030* 6
```

432	00031*	0000	CRLF,	0	/TYPE A CARRIAGE RETURN AND LINE FEED
433	00032*	5433		JMP I .+1	/AC IGNORED, RETURNS 0. LINK PRESERVED.
434	00033*	6171		CRLF1	
435					
436	00034*	0000	OCTPNT,	0	/TYPE THE CONTENTS OF THE AC AS OCTAL DIGITS
437	00035*	5436		JMP I .+1	/CAUTION---LINK MODIFIED
438	00036*	6623		OCTPN1	
439					
440	00037*	0000	MSG,	0	/PRINT THE TEXT STRING FOLLOWING THE CALL
441	00040*	5441		JMP I .+1	/AC MUST BE 0 AT CALL, RETURNS 0. LINK PRESERVED.
442	00041*	6644		MSG1	
443					
444	00042*	0000	PCHAR,	0	/CONVERT SIX-BIT CHAR TO ASCII AND TYPE
445	00043*	5444		JMP I .+1	/ENTER WITH CHAR IN AC. RETURNS 0 AC,
446	00044*	6656		PCHAR1	/PRESERVED LINK
447					
448	00045*	0000	PCPNT,	0	/PRINT FLAGS, PC, AC, MQ
449	00046*	5447		JMP I .+1	/ENTER WITH 0 AC. RETURNS 0 AC, LINK MODIFIED.
450	00047*	6053		PCACMQ	
451					
452	00050*	0000	DELAY,	0	/.063 SEC DELAY
453	00051*	2077		ISZ DELAY1	
454					

```

486 06465 6117      HLTD1
487
488 06466 7001  APT,  IAC      /MAKE HLTFLG 1, SO STRAY HALTS WILL HANG UP CPU
489 06467 3063      DCA HLTFLG
490 06470 5465      JMP I KBOOT1 /NOW RUN MR78
491
492                /////////////////////////////////////////////////// BEGINNING OF THE INTERNAL DIAGNOSTIC ///////////////////////////////////////////////////
493                /////////////////////////////////////////////////// THIS PART RUNS IN PANEL MEMORY ///////////////////////////////////////////////////
494 06471 7200  STRTUP, CLA
495 06472 3000      DCA ORIGIN
496 06473 1000  CPLOOP, TAD ORIGIN /FILL CP RAM (ADDRESSES 1-77) WITH ADDRESS
497 06474 3400      DCA I ORIGIN
498 06475 2000      ISZ ORIGIN
499 06476 5273      JMP CPLOOP
500 06477 2000  CPRAM,  ISZ ORIGIN /PERFORM CHECKSUM ON CP RAM
501 06500 1400      TAD I ORIGIN /USING LOCATION 0 AS ADDRESS POINTER
502 06501 1001      TAD PSTAT  /AND LOCATION 1 AS CHECKSUM ACCUMULATOR
503 06502 3001      DCA PSTAT
504 06503 1000      TAD ORIGIN
505 06504 1250      TAD PM77
506 06505 7710      SPA CLA
507 06506 5277      JMP CPRAM /NOT DONE YET--GO BACK FOR MORE
508 06507 1001      TAD PSTAT  /COMPARE ACCUMULATED SUM WITH EXPECTED
509 06510 1252      TAD CKSUM1  /IS RESULT CORRECT?
510 06511 7440      SZA
511 06512 5651      JMP I PK6000 /NO--CP RAM FAILURE--TURN OFF "OK" LIGHT
512 06513 7330      CLA STL RAR /4000 TO AC
513 06514 3001      DCA PSTAT  /SET "HLT" BIT IN PANEL STATUS WORD
514 06515 1251  CPROM, TAD PK6000 /NOW TRY A CHECKSUM ON THIS ROM.
515 06516 3000      DCA ORIGIN
516 06517 1400      TAD I ORIGIN
517 06520 2000      ISZ ORIGIN
518 06521 5317      JMP .-2
519 06522 7440      SZA /CKSUM2 IS SUCH THAT RESULT BETTER BE 0
520 06523 5651      JMP I PK6000 /IT ISN'T--TURN OFF "OK" LIGHT.
521 06524 1202  PAGE0, TAD PZREL /MOVE PANEL PAGE 0 INTO PLACE
522 06525 3010      DCA 10
523 06526 1201      TAD KRAREA
524 06527 3011      DCA 11
525 06530 1200      TAD KRELSZ
```

```

540 06547 3010      DCA 10
541 06550 1000      TAD ORIGIN
542 06551 3410      DCA I 10
543 06552 2000      ISZ ORIGIN
544 06553 5350      JMP .-3
545 06554 1410  FLD0CK, TAD I 10      /COMPARE CONTENTS
546 06555 7041      CIA
547 06556 1000      TAD ORIGIN      /WITH EXPECTED
548 06557 7440      SZA
549 06560 5255  MMR,  JMP MMERR      /NOT SAME--COMPLAIN
550 06561 2000      ISZ ORIGIN      /AND DO ALL ADDRESSES
551 06562 5354      JMP FLD0CK
552 06563 4031      JMS CRLF
553 06564 4037      JMS MSG
554 06565 0100      TEXT %A%      /TYPE "A"--PANEL R/W MEMORY FILLED
555 06566 4023      JMS MOVE      /LOAD AND RUN THE DIAGNOSTIC
556 06567 6672      STDIAG-1      /FROM
557 06570 0065      DIAG-1      /TO
558 06571 6677      DIAG-LAST      /SIZE
559 06572 0141      OPRAT2      /STARTING ADDRESS

```

```

560
561 ////////////////////////////////// MISCELLANEOUS SUBROUTINES IN PANEL MEMORY //////////////////////////////////
562 06573 6271  MOVE1, CDF 70      /FIX DF IN CASE BOOTSTRAPPING FLOPPY AFTER IOF
563 06574 1423      TAD I MOVE
564 06575 3010      DCA 10      /"FROM"
565 06576 2023      ISZ MOVE
566 06577 1423      TAD I MOVE
567 06580 3011      DCA 11      /"TO"
568 06601 2023      ISZ MOVE
569 06602 1423      TAD I MOVE
570 06603 3012      DCA 12      /"-NUMBER OF WORDS"
571 06604 2023      ISZ MOVE
572 06605 1423      TAD I MOVE
573 06606 3000      DCA ORIGIN      /STARTING ADDRESS IN MAIN MEMORY
574 06607 6271  MOVE2, CDF 70
575 06610 1410      TAD I 10
576 06611 6203      CDF CIF 0
577 06612 3411      DCA I 11
578 06613 2012      ISZ 12
579 06614 5207      JMP MOVE2
580 06615 5466      JMP I PSTAR2
581
582 06616 6046  TYPE1, TLS      /REST OF TYPE CHARACTER ROUTINE
583 06617 6041      TSF
584 0
```