

IDENTIFICATION

Product Code: Maindec 12-D6BA-D(P)

Product Name: VR12 Display Test

Date Created: June 6, 1969

Maintainer: Diagnostics Group

Author: Dave Ferrarini

Mnemonic: DISPTST

1. ABSTRACT

This program tests the PDP-12 Display System by generating three distinct patterns on the scope, two with the DIS Instruction, and one with the DSC Instruction.

2. REQUIREMENTS

2.1 EQUIPMENT

- a. PDP-12A or PDP-12B

2.2 STORAGE

Most of locations 4000_g to 6000_g

3. LOADING PROCEDURES

3.1 METHOD

- a. Mount a DIAL Tape on Unit 0.
- b. Set mode to LINC and depress I/O Preset twice.
- c. Set LSW=701 RSW=7300 and hit the DO toggle.
- d. Depress Start 20.
- e. Call the program from the ASR by:
 - LO DIS TEST, 0)
- f. DIAL Loader will halt at ~~7525~~. - 7775
- g. Depress I/O Preset.
- h. Depress Start 20 to execute.
- i. Restart Procedure: Depress Start 20.
- j. This program is also available on Binary Paper Tape.

4. OPERATOR ACTION

Upon starting, the program will alternately display the three patterns, each for approximately ten seconds.

- a. Freeze on current pattern.

Striking the key F will direct the program to lock into the routines that are controlling display of the current pattern.

b. Alternate between three patterns.

Striking any key but F will direct the program to alternate the display between the three patterns. It should be noted that requesting the alternate sequence while in alternate mode or the freeze sequence while in freeze mode has no effect.

5. PROGRAM DESCRIPTION

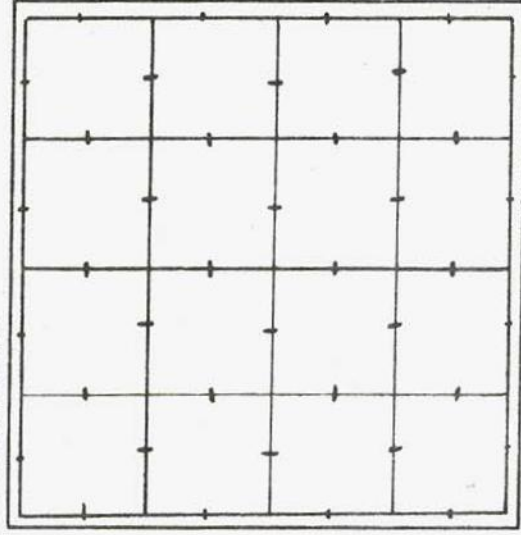
- a. The pattern generated by the DSC instruction takes the following form:

(QUADRANT 2)	CHAN Ø	HALF SIZE	CHAN 1	FULL SIZE	(QUADRANT 1)
(QUADRANT)	CHAN Ø	FULL SIZE	CHAN 1	HALF SIZE	(QUADRANT 4)

The pattern does what the display says. One half of one character is displayed in one corner of the scope, then half of one character is displayed in the opposite corner of the scope. The left half of the character in quadrants 2 and 4 are displayed first, then the left half of the character in quadrants 1 and 3 are displayed. When the left half of all characters on the scope have been displayed the sequence is repeated for the right half of the characters.



- b. One pattern generated by the DIS Instruction takes the following form:



This permits calibration of the scope.

- c. Display a cross.

This pattern is two diagonal lines from the bottom left corner to the top right corner of the display, and bottom right to top left. It is used when setting up the D/A converters of the VC12 Display System.

NOTE: Setting sense switch $\emptyset$ to a one will cause a return to the Dial monitor.

0000			
0001			
0002			
0003			
0004			
0005			
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0007			
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0065			
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0067			
0068			
0069			
0070			
0071			
0072			
0073			
0074			

*20

/DIS TEST VERSION 14
/PDP-12 DISPLAY CONTROL AND SCOPE TEST
/COPYRIGHT 1969 DIGITAL EQUIPMENT CORP.
/FERRARINI D.
/POINT DISPLAY PATTERN [DISPAT
/CHARACTER DISPLAY PATTERN [DSCPAT
/DISPLAY A DIAGONAL LINE [DIAG
/6-7-69

SEGMENT 2

*10

0010 0000 04BETA,0
0011 0000 03BETA,0
0012 0000 02BETA,0
0013 0000 01BETA,0

*20
LDA I
1
STC FLAG
SET I 17
-300
JMP CLOCK /CHECK CLOCK
JMP DISPAT /DO DSC TEST
JMP 400 /DO DIS PATTERN
DISPAT, JMP TST1 /CHECK TTY OPTIONS
JMP TST2 /BACK TO GO
JMP TTYOPT
JMP DISPAT-3
JMP DISPAT-1

*100

/THE SUBROUTINE BELOW WILL GENERATE 5
/LINES ACROSS THE SCREEN. THE POINT
/SPACING IS 4 UNITS
/THE FIRST LEFT HAND POINT IS
/0000, THE LAST RIGHT HAND POINT IN
/EACH LINE IS 0774.
/A GLITCH IS PLACED AT THE HORIZONTAL
/POINTS OF 100,300,500,AND 700 ON
/EACH LINE
TST1, LDA
0
STA I
0
LDA I
10
STC REL
SET I 2
0

0100 1000
0101 0000
0102 1060
0103 0000
0104 1020
0105 0010
0106 4134
0107 0062
0110 0000

0174
0175
0176
0177
0200
0201
0202
0203
0204
0205
0206
0207
0208
0209
0210
0211
0212
0213
0214
0215
0216
0217
0218
0219
0220
0221
0222
0223
0224
0225
0226
0227
0228
0229
0230
0231
0232
0233
0234
0235
0236
0237
0240
0241
0242
0243
0244
0245
0246
0247
0250
0251
0252
0253
0254
0255
0256
0257
0260
0261
0262
0263
0264
0265
0266
0267
0270
0271
0272

0201 1000
0202 0767
0203 2134
0204 0142
0205 6140
0206 1000
0207 0000
0208 1060
0209 0000
0210 1020
0211 0020
0212 4134
0213 6135
0214 0011
0215 1020
0216 7774
0217 1200
0218 0134
0219 1460
0220 7774
0221 6215
0222 1020
0223 0010
0224 4134
0225 6211

/GLITCH GENERATOR

T1GL,

LDA I
767
ADD REL
DIS 2
JMP LP1+3
LDA
0
STA I
0
LDA I
20
STC REL
JMP LP1
CLP
LDA I
7774
LAM
REL
SAE I
7774
JMP T1GL+7
LDA I
10
STC REL
JMP T1GL+3

/THIS ROUTINE GENERATES 5 VERTICAL LINES
/AT HORIZONTAL LOCATIONS 0,177,377,577,777.
/GLITCHES ARE DISPLAYED AT VERTICAL LOCATIONS
/177,377,500,700 ON THE LINES.
TST2, LDA
0
STA I
0
CLR
STC REL

0232 1000
0233 0000
0234 1060
0235 0000
0236 0011
0237 4134

/SET UP INDEX REG.
/GO DISPLAY SOME POINTS

TST2LP,

JMP LP2A
JMP LP2B
LDA
REL
BCO I
100
RCL I
7600
AZE I
JMP GL2
LDA I
4
ADM
REL
SAE I
1000
JMP TST2LP
JMP TST2+3

/DONE ALL POINTS YET

/SET UP INDEX REGISTERS

0262 1000 LP2A, LDA

0273	0263	0000
0274	0264	1060
0275	0265	0000
0276	0266	0062
0277	0267	0000
0278	0270	0063
0301	0271	0177
0302	0272	0064
0303	0273	0377
0304	0274	0065
0305	0275	0577
0306	0276	0066
0307	0277	0777
0308	0300	6265

0	STA I
0000	
0	SET I 2
0	SET I 3
177	SET I 4
377	SET I 5
577	SET I 6
777	JMP LP2A+3

/ACTUALLY DISPLAY THE 5 POINTS
LP2R,

0301	1000
0302	0000
0303	1060
0304	0000
0305	1000
0306	0134
0307	0142
0308	0017
0310	0146
0311	1000
0312	0134
0313	1120
0314	0200
0315	0143
0316	0017
0317	0145
0318	1000
0319	0134
0320	0144
0321	0304
0322	6301
0323	1020
0324	0767
0325	4343
0326	0067
0327	7772
0328	0070
0329	0001
0330	1020
0331	0767
0332	1170
0333	0227
0334	6342
0335	6301
0336	1020
0337	0004
0338	4343

0	LDA
0	STA I
0	LDA
REL	REL
DIS 2	ADA I
COM	DIS 3
DIS 6	COM
LDA	DIS 5
REL	LDA
ADA I	REL
200	DIS 4
DIS 3	JMP LP2H+3
COM	
DIS 5	
LDA	
REL	
DIS 4	
JMP LP2H+3	

/DISPLAY THE GLITCHES ON THE VERTICAL LINES
GL2,

0325	1000
0326	0000
0327	1060
0328	0000
0329	0075
0330	7772
0331	1020
0332	0767
0333	4343
0334	0067
0335	7772
0336	0070
0337	0001
0338	1020
0339	0767
0340	1170
0341	0227
0342	6342
0343	6301
0344	1020
0345	0004
0346	4343

0	LDA
0	STA I
0	SET I 15
-5	LDA I
767	STC GL2V
SET I 7	SET I 7
-5	SET I 10
1	LDA I
767	ADM I 10
ADM I 10	XSK I 7
XSK I 7	JMP *-4
JMP *-4	
JMP LP2R	
LDA I	
4	STC GL2V

0370	0353	0235	XSK I 15	/RESET HORIZONTAL POSITION
0373	0354	6336	JMP GL2V-5	/GO BACK
0374	0355	6262	JMP LP2A	
0375	0356	6330	JMP GL2+3	
0376				
0377				
0400				
0401				
0402				
0403				
0404				
0405				
0406				
0407				
0408				
0409				
0410				
0411				
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0441				
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0445				
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0449				
0450				
0451				
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0456				
0457				
0458				
0459				
0460				
0461				
0462				

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XSK I 15
JMP GL2V-5
JMP LP2A
JMP GL2+3

*0000
SET I 17
JMP CLOCK
JMP DSCPAT
JMP DIAG

DSCPAT, SET I 15
FOR
01GRID-1
LDA I 15
STC 01RETA
LDA I 15
STC 02RETA
LDA I 15
STC 03RETA
LDA I 15
STC 04RETA
/HAFFLG=0 WHEN DISPLAYING LEFT HALF OF PATTERN
/=4 WHEN DISPLAYING RIGHT HALF
STC HAFFLG
SET I 7
RCHNG-1
SET I 14
-4
/IN RIGHT HALF PASS NOP BELOW WILL BE REPLACED
BY ADA I 7
/LEFT AND RIGHT HALF SEQUENCES ARE STAGGERED BY
A CONSTANT
/20 FOR FULL SIZE CHARACTERS, 10 FOR HALF SIZE
LDA I 15
NOP
STA I 15
LDA I 15
STA I 15
XSK I 14
JMP PH1-1
STC LNFLG
E- 0 WHEN DOING LN 1
N 1
SET I 15
-6
ESF
/ENABLE HALF SIZE CHAR
/SELECT CHAN 0 AND
/SET HORIZ COORD
/VERT COORD TO AC
/DSC IN CHAD 2
/BIMP HORIZ COORD TO
ADD 1
STC 02HOR
ADD 04HOR
RSE I
4000

/PUT GRID PATTERN ADDR
/EACH CHAD IN 4 RETAS
/INITIALIZE ARGUMENTS
/THERE ARE
/4 QUADRANTS
/NO
/=0 WHEN DOING LN 2 *N
/THERE ARE 6 CHAR ON L
/ENABE HALF SIZE CHAR
/SELECT CHAN 0 AND
/SET HORIZ COORD
/VERT COORD TO AC
/DSC IN CHAD 2
/BIMP HORIZ COORD TO
ADD 1
STC 02HOR
ADD 04HOR
RSE I
4000

```

ADDRESS	DATA	OPERATION	COMMENT
0452	4001	STC 1	
0453	2706	ADD 04VER	
0454	1770	DSC I 04BETA	/DSC IN QUAD 4
0455	1020	LDA I	/RUMP HORIZ COORD
0456	0010	RH04, 10	
0457	2001	ADD 1	
0460	4704	STC 04HOR	
0461	0235	XSK I 15	/DONE A LN 1
0462	6437	JMP LOOP1	/NO
0463	2656	ADD LNFLG	
0464	0470	A7E I	/DONE 2 LNS 1
0465	6511	JMP FULS17	/YES GO TO FULL SIZE C
0466	0075	HARS	
0467	7766	SET I 15	/THERE ARE 11
0470	0011	-11	/CHARS IN LN 2
0471	4656	CLR	/SET LNFLG
0472	2673	STC LNFLG	/TO EXIT ON NEXT CHK
0473	2655	ADD K02HOR	/RESET HORIZ
0474	4674	ADD HAFFLG	/AND VERT
0475	2675	STC 02HOR	/COORD
0476	1120	ADA I	/FOR LN 2
0477	7737	-40	
0478	4676	STC 02VER	
0479	2703	ADD K04HOR	
0480	2655	ADD HAFFLG	
0481	4704	STC 04HOR	
0482	2705	ADD K04VER	
0483	1120	ADA I	
0484	7737	-40	
0485	4706	STC 04VER	
0486	6437	JMP LOOP1	/DO LN 2
0487	0075	SET I 15	/SET CTR
0488	7771	-6	/FOR LN 1
0489	0076	SET I 16	/DELAY, SIZE CHANGE NEXT
0490	7737	-40	
0491	0236	XSK I 16	
0492	6515	JMP --1	
0493	1020	LDA I	/ENABLE
0494	0200	200	/FULL SIZE
0495	0004	ESF	/CHAR
0496	4656	STC LNFLG	/SET FLAG FOR LN 1
0497	2670	ADD 01HOR	/HORIZ COORD
0498	1620	RSE I	
0499	4000	4000	
0500	4001	STC 1	/QUAD 1
0501	2672	ADD 01VER	/RUMP HORIZ
0502	1773	DSC I 01BETA	
0503	1020	LDA I	
0504	0200	ADD 1	
0505	4670	STC 01HOR	/HORIZ COORD
0506	2700	ADD 03HOR	/CHAN 0
0507	4001	STC 1	
0508	2702	ADD 03VER	/QUAD 3
0509	1771	DSC I 03BETA	
0510	1020	LDA I	
0511	0200	ADD 1	
0512	4700	STC 03HOR	
0513	2001	ADD 1	
0514	4670	STC 01HOR	
0515	2700	ADD 03HOR	
0516	4001	STC 1	
0517	2702	ADD 03VER	
0518	1771	DSC I 03BETA	
0519	1020	LDA I	
0520	0200	ADD 1	
0521	4670	STC 01HOR	
0522	2700	ADD 03HOR	
0523	4001	STC 1	
0524	2702	ADD 03VER	
0525	1771	DSC I 03BETA	
0526	1020	LDA I	
0527	0200	ADD 1	
0528	4670	STC 01HOR	
0529	2700	ADD 03HOR	
0530	4001	STC 1	
0531	2702	ADD 03VER	
0532	1771	DSC I 03BETA	
0533	1020	LDA I	
0534	0200	ADD 1	
0535	4670	STC 01HOR	
0536	2700	ADD 03HOR	
0537	4001	STC 1	
0538	2702	ADD 03VER	
0539	1771	DSC I 03BETA	
0540	1020	LDA I	
0541	0200	ADD 1	
0542	4670	STC 01HOR	
0543	2700	ADD 03HOR	
0544	4001	STC 1	
0545	2702	ADD 03VER	
0546	1771	DSC I 03BETA	
0547	1020	LDA I	
0548	0200	ADD 1	
0549	4670	STC 01HOR	
0550	2700	ADD 03HOR	
0551	4001	STC 1	
0552	2702	ADD 03VER	
0553	1771	DSC I 03BETA	
0554	1020	LDA I	
0555	0200	ADD 1	
0556	4670	STC 01HOR	
0557	2700	ADD 03HOR	
0558	4001	STC 1	
0559	2702	ADD 03VER	
0560	1771	DSC I 03BETA	
0561	1020	LDA I	
0562	0200	ADD 1	
0563	4670		

0561	0545	05235	XSK I 15	/DONE A LN 3
0562	0546	4523	JMP LOOP2	/NO
0563	0547	2656	ADD LNFLG	
0564	0550	0470	AZE I	/DONE 2 LNS. J
0565	0551	6577	JMP HAFCHK	/YES CHK FOR 2ND HALF
			OF PATTERN	
0566	0552	0075	SET I 15	/NO SET FOR LN 2
0567	0553	7766	-11	
0570	0554	0011	CLR	/SET LNFLG FOR
0571	0555	4656	STC LNFLG	/EXIT TO HAFCHK
0572	0556	2667	ADD KO1HOR	/RESET COORDINATES
0573	0557	2655	ADD HAFFLG	
0574	0560	2655	ADD HAFFLG	
0575	0561	4670	STC Q1HOR	
0576	0562	2671	ADD KO1VER	
0577	0563	1120	ADA I	
0600	0564	7737	-40	
0601	0565	4672	STC Q1VER	
0602	0566	2677	ADD KO3HOR	
0603	0567	2655	ADD HAFFLG	
0604	0570	2655	ADD HAFFLG	
0605	0571	4700	STC Q3HOR	
0606	0572	2701	ADD KO3VER	
0607	0573	1120	ADA I	
0610	0574	7737	-40	
0611	0575	4702	STC Q3VER	
0612	0576	6523	JMP LOOP2	
0613	0577	1000	HAFCHK, LDA	/DO LN 2
0614	0600	0655	HAFFLG	/DONE BOTH
0615	0601	0450	AZE	/LEFT AND RIGHT
0616	0602	6614	JMP DSCEND	/SEQUENCES J
0617	0603	1020	LDA I	/YES EXIT
0620	0604	0004	4	/NO SET FOR
0621	0605	4655	STC HAFFLG	/DSC RIGHT SEQ.
0622	0606	1020	LDA I	/SET HAFFLG FOR EXIT
0623	0607	1127	ADA I 7	/ENABLE INST TO ADD A
0624	0610	4425	STC RH1	/CONSTANT FOR
0625	0611	0075	SET I 15	/RIGHT HALF SEQ.
0626	0612	0666	KO1HOR-1	
0627	0613	6420	JMP RH1-5	
0630	0614	1020	LDA I	/DO RIGHT HALF SEQ.
0631	0615	0016	NOP	/RESTORE NOP
			DSCEND, LDA I	/FOR NEXT LEFT HALF SE
			0.	
0632	0616	4425	STC RH1	
0633	0617	6635	JMP TTYOPT	/CHK OPTIONS
0634	0620	6402	JMP DSCPAT-3	
0635	0621	1000	LDA	/CHK FOR ALTERNATING S
			CLOCK, LDA	
			Eq.	
0636	0622	0654	FLAG	
0637	0623	0470	AZE I	/WHICH SEQ. J
0640	0624	6000	JMP 0	/FREEZE SEQ IGNORE CLO
			CK	
0641	0625	0237	XSK I 17	
0642	0626	6000	JMP 0	/TICK CLOCK AND
0643				/REFRESH SCOPE
0644	0627	1000	LDA	
0645	0630	0000	0	
0646	0631	1120	ADA I	
0647	0632	0001	1	
0650	0633	4000	STC 0	
0651	0634	6000	JMP 0	
0652				
0653				

0654	0635	1000	TTYOPT, LDA	/SAVE RTN JMP
0655	0636	0000	0	
0656	0637	4653	STC EXIT	
0657	0640	0415	KST	/HAVE TTY OPTIONS REEN
0660			REQUESTED J	
0661	0641	6000	JMP 0	/NO RTN
0662	0642	0500	IOR	/YES GET CHAR
0663			PMODE	
0664	4643	6036	KRR	/F FREEZES THE
0665			LMODE	
0666	0644	1460	SAE I	/CURRENT PATTERN
0667	0645	0306	306	/ANY OTHER KEY ALTERNA
0670			TES	
0671	0646	6652	JMP EXIT-1	/FREEZE ON CURRENT PAT
0672	0647	0011	CLR	/BY SETTING FLAG TO 0
0673			TERN	/SET FLAG .NE. TO 0
0674	0650	4654	STC FLAG	
0675	0651	6653	JMP EXIT	
0676	0652	4654	STC FLAG	
0677	0653	0000	EXIT, 0	
0678	0654	0000	FLAG, 0	
0679	0655	0000	HAFFLG, 0	
0680	0656	0000	LNFLG, 0	
0681	0657	0010	RHCHNG, 10	
0682	0658	0004	4	
0683	0659	0004	10	
0684	0660	0004	4	
0685	0661	0004	01GRID, 04VER	/ADDR -1 OF GRID PATTE
0686	0662	0004	RNS	
0687	0663	0706	02GRID, 04VER+36	
0688	0664	0744	03GRID, 04VER+74	
0689	0665	1002	04GRID, 04VER+132	
0690	0666	1040	K01HOR, 450	
0691	0667	0450	01HOR, 0	
0692	0668	0000	K01VER, 340	
0693	0669	0340	01VER, 0	
0694	0670	0000	K02HOR, 10	
0695	0671	0010	02HOR, 0	
0696	0672	0000	K02VER, 340	
0697	0673	0010	02VER, 0	
0698	0674	0000	K03HOR, 10	
0699	0675	0340	03HOR, 0	
0700	0676	0000	03VER, 0	
0701	0677	0010	K04HOR, 600	
0702	0678	0000	04HOR, 0	
0703	0679	0000	K04VER, -300	
0704	0680	0000	04VER, 0	
0705	0681	0000	/GRID PATTERNS	
0706	0682	0000	/QUAD 1 LEFT HALF	
0707	0683	4136	4136 /C	
0708	0684	1077	1077 /H	
0709	0685	4477	4477 /A	
0710	0686	3077	3077 /N	
0711	0687	0000	0 /SPACE	
0712	0688	2101	2101 /I	
0713	0689	4477	4477 /F	
0714	0690	0177	0177 /U	
0715	0691	0177	0177 /L	
0716	0692	0177	0177 /L	
0717	0693	0177	0177 /L	
0718	0694	0000	0 /SPACE	
0719	0695	0000		
0720	0696	0000		
0721	0697	0000		
0722	0698	0000		
0723	0699	0000		
0724	0700	0000		
0725	0701	7477		
0726	0702	0000		
0727	0703	0600		
0728	0704	0000		
0729	0705	7477		
0730	0706	0000		
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0747	0722	5121	5121	/S
0751	0723	7741	7741	/I
0751	0724	4543	4543	/Z
0752	0725	4577	4577	/E
0753				/RIGHT HALF
0754	0726	2241	2241	/C
0754	0727	7710	7710	/H
0756	0730	7744	7744	/A
0757	0731	7706	7706	/N
0760	0732	0000	0	/SPACE
0761	0733	0177	0177	/I
0762	0734	4044	4044	/F
0763	0735	7701	7701	/H
0764	0736	0301	0301	/L
0765	0737	0301	0301	/L
0766	0740	0000	0	/SPACE
0767	0741	4651	4651	/S
0771	0742	0041	0041	/I
0771	0743	6151	6151	/Z
0772	0744	4145	4145	/E
0773				/QUAD 2 LEFT HALF
0774	0745	4136	4136	/C
0775	0746	1077	1077	/H
0776	0747	4477	4477	/A
0777	0750	3077	3077	/N
1000	0751	0000	0	/SPACE
1001	0752	4136	4136	/0
1002	0753	1077	1077	/H
1003	0754	4477	4477	/A
1004	0755	0177	0177	/L
1005	0756	4477	4477	/F
1006	0757	0000	0	/SPACE
1007	0760	5121	5121	/S
1010	0761	7741	7741	/I
1011	0762	4543	4543	/Z
1012	0763	4577	4577	/E
1013				/RIGHT HALF
1014	0764	2241	2241	/C
1015	0765	7710	7710	/H
1016	0766	7744	7744	/A
1017	0767	7706	7706	/N
1020	0770	0000	0	/SPACE
1021	0771	3641	3641	/0
1022	0772	7710	7710	/H
1023	0773	7744	7744	/A
1024	0774	0301	0301	/L
1025	0775	4044	4044	/F
1026	0776	0000	0	/SPACE
1027	0777	4651	4651	/S
1030	1000	0041	0041	/I
1031	1001	6151	6151	/Z
1032	1002	4145	4145	/E
1033				/QUAD 3 LEFT HALF
1034	1003	4136	4136	/C
1035	1004	1077	1077	/H
1036	1005	4477	4477	/A
1037	1006	3077	3077	/N
1040	1007	0000	0	/SPACE
1041	1010	4136	4136	/0
1042	1011	4477	4477	/F
1043	1012	0177	0177	/U
1044	1013	0177	0177	/L
1045	1014	0177	0177	/L

1046	1015	0000	0	/SPACE
1047	1016	5121	5121	/S
1050	1017	7741	7741	/I
1051	1020	4543	4543	/Z
1052	1021	4577	4577	/E
1053				/RIGHT HALF
1054	1022	2241	2241	/C
1055	1023	7710	7710	/H
1056	1024	7744	7744	/A
1057	1025	7706		7706 /N
1060	1026	0000	0	/SPACE
1061	1027	3641	3641	
1062	1030	4044	4044	
1063	1031	7701	7701	
1064	1032	0301	0301	
1065	1033	0301	0301	
1066	1034	0000	0	
1067	1035	4651	4651	
1070	1036	0041	0041	
1071	1037	6151	6151	
1072	1040	4145	4145	
1073				/QUAD 4 LEFT HALF
1074	1041	4136	4136	
1075	1042	1077	1077	
1076	1043	4477	4477	
1077	1044	3077	3077	
1100	1045	0000	0	
1101	1046	2101	2101	
1102	1047	1077	1077	
1103	1050	4477	4477	
1104	1051	0177	0177	
1105	1052	4477	4477	
1106	1053	0000	0	
1107	1054	5121	5121	
1110	1055	7741	7741	
1111	1056	4543	4543	
1112	1057	4577	04EL, 4577	
1113			/RIGHT HALF	
1114	1060	2241	2241	
1115	1061	7710	7710	
1116	1062	7744	7744	
1117	1063	7706	7706	
1120	1064	0000	0	
1121	1065	0177	0177	
1122	1066	7710	7710	
1123	1067	7744	7744	/A
1124	1070	0301	0301	/L
1125	1071	4044	4044	/F
1126	1072	0000	0	/SPACE
1127	1073	4651	4651	/S
1130	1074	0041	0041	/I
1131	1075	6151	6151	/Z
1132	1076	4145	04ER, 4145	
1133				
1134				
1135				
1136				
1137				
1140				
1141				
1142	1077	0077		/THIS ROUTINE DISPLAYS A DIAGONAL
1143	1100	6377		/LINE FROM BOTTOM LEFT TO TOP RIGHT
1144	1101	6621		/OF SCREEN
				DIAG, SET I 17
				LNTIME, -1400
				JMP CLOCK

1145	1102	7104	JMP GO
1146	1103	6023	JMP DISPAT-5
1147	1104	1020	LDA I
1148	1105	0400	400
1149	1106	0061	SET I 1
1150	1107	1777	1777
1151	1108	0161	DIS I 1
1152	1109	1120	ADA I
1153	1110	0001	1
1154	1111	1400	SAE I
1155	1112	1400	1400
1156	1113	1400	JMP -5
1157	1114	7110	JMP TTYOPT
1158	1115	6635	JMP GO-3
1159	1116	7101	
1160	1117		
1161			
1162			
1163			
1164			
1165			

0000 ERPOFS

RHC1	4532
RHC2	4444
RHC3	4542
RHC4	4456
RHC5	4564
RHC6	4477
RHC7	4574
RHC8	4506
RHC9	4621
RHC10	5077
RHC11	4030
RHC12	4614
RHC13	4405
RHC14	4653
RHC15	4654
RHC16	4511
RHC17	4325
RHC18	4343
RHC19	5104
RHC20	4577
RHC21	4655
RHC22	4667
RHC23	4671
RHC24	4673
RHC25	4675
RHC26	4677
RHC27	4701
RHC28	4703
RHC29	4705
RHC30	4656
RHC31	5100
RHC32	4437
RHC33	4523
RHC34	4135
RHC35	4262
RHC36	4301
RHC37	4013
RHC38	4663
RHC39	4670
RHC40	4672
RHC41	4012
RHC42	4664
RHC43	4674
RHC44	4676

03RETA 4011
03GRID 4665
03HOP 4700
03VER 4702
04RETA 4010
04FL 5057
04FR 5076
04GRID 4666
04HOR 4704
04VER 4706
REL 4134
RHCHNG 4657
RH1 4425
TST1 4100
TST1LP 4111
TST2 4232
TST2LP 4241
TTYOPT 4635
TICL 4206