

CGTM# 109
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DTUT

A Utility Program for the Graphic Interpretation Facility

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I Program Description

DTUT is a 620/i utility program for the Graphic Interpretation Facility. Its intended use is mainly for storing and/or retrieving data on drum or tape but can also be used as a diagnostic test of these devices and of the BIC (Buffer Interlace Controller). DTUT can also be used in connection with the 360 program, MAFPR1, to send a 620/i core image to a printer. Use of this feature is described below under Procedures.

The program lists its command repertoire on the display and a cursor to indicate that a type-in is expected. Commands for action may then be entered via the teletype or the auxiliary keyboard. A list of the last five commands is maintained on the display and all the commands may be, at user option, printed on the teletype. The latter feature could be used, for example, to provide a log of what has been written on a tape. The general form of a command is a two character operation code followed by a number of arguments. All arguments are octal numbers and a zero argument may be omitted. The intraline delimiter is the comma; the final delimiter, the semi-colon.

II Commands

WT,A,B; Write tape where A=FWA and B=LWA. The tape write is done using programmed I/O.

WB,A,B; Same as WT except the tape write is done using the BIC.

RT,A,B; Read tape where A=FWA and B=LWA. The tape read is done using programmed I/O.

RB,A,B; Same as RT except the tape read is done using the BIC.

WE; Write end of file on tape.

RE; Rewind tape.

SK,N; Skip to file N on tape. N=0 is the same as N=1.

TT,N; Tape write and read test of N records using the BIC. Each record consists of 3600₈ random numbers. In case of error the sumcheck before write, the sumcheck after read, and the record number are displayed. If S.S. 1 is on, the display is halted during the test and error messages are sent to the teletype. This may be useful to determine whether there is any interference between the display and the BIC. If S.S. 2 is on as well, the words containing the bit discrepancies are also printed on the teletype.

II Commands (cont.)

- WD, A, B, X; Write to drum where A=FWA, B=LWA, and X=drum address. Drum addresses are track-sector addresses 00000-17777 where bits 12-5 contain track and bits 4-0, the sector. There are 3600₀ words/track and 74₀ words/sector. Appendix 4 is a table of drum track addresses.
- RD, A, B, X; Read from drum where A=FWA, B=LWA, and X=drum address. See description of WD for drum address format.
- DT; Write the contents of drum tracks 15600-17740 to tape. This command may be used to maintain a back-up copy of the system.
- TD; Restore the contents of drum tracks 15600-17740 from tape. The tape is assumed to have been written using the DT command. See Section V Procedures for how to boot-strap the system from such a tape.
- GO, A; Transfer control to location A.
- DS, A; Display in octal the contents of core beginning at location A. Function key 14 may be used to continue the display initiated by this command.
- PR, A, B; Send core image saved on drum tracks 0-3 to the 360 to be printed by the program MAFPRT. See Section V Procedures for use of this command.

III Error Indicators

- A. The input line is cleared if the command is not recognized.
- B. If a tape parity error is encountered, the message TAPE ERROR is displayed. On a tape read, the program tries five times before displaying this message. See the description of the TT command for its additional error messages.
- C. After a drum operation, the state of the indicator bits is displayed. A one bit means the indicator is set; a zero, reset. The normal state is 000002. The bits are:

sign bit	Abnormal BIC termination
bit 6	Transfer timing
5	Track timing
4	Parity error
3	Illegal address
2	Drum busy
1	Drum ready
0	Drum failure

IV Function Key Use

Key Number	Use
3	Backspace input command
4	Turn off teletype output
6	Delete character in input command
7	Insert blank in input command
9	Clear input line and/or return from octal dump display
11	Forward space input command
12	Turn on teletype output
14	Continue octal dump display initiated by a DS command

V Procedures

A. To boot-strap the system from a tape written with a DT command

1. Enter the following tape read boot-strap

```

16740   exc  21    100021
        41   oar  20    103120
        42   obr  21    103221
        43   exc  20    100020
        44   exc  10    100010
        45   sen 20,*+4 101020
        46                               16751
        47   jmp  *-2    1000
        50                               16745
16751   hlt                               0

```

2. Mount the tape at load point

3. Set A=0, B=16700, P=16740, U=0. Run

4. Set P=13200. Run

5. Enter command TD to restore drum tracks 15600-17740

B. To boot-strap the system from drum

1. Enter the following drum read boot-strap

```

16760   exc  21    100021
        61   oar  20    103120
        62   obr  21    103221
        63   exc  20    100020
        64   exc  14    100014
        65   txa                               5041
        66   oar 114    103114
        67   sen 20,*+4 101020
        70                               16773
        71   jmp  *-2    1000
        72                               16767
16773   hlt                               0

```

V Procedures (cont.)

- B. 2. Set A=17000,B=17777,X=16600, P=16760,U=0. Run
 3. Load desired program from drum. I.e., set A=FWA, B=LWA, X= Drum address, U=0, P=17301. Run. Appendix B is a directory of drum tracks 15600-17740.
- C. To send a 620/i core image to the 360 to be printed
1. To save core image and load DTUT, set P=17301,A=17000, B=17300, U=0, X=17204, System Reset, Run. Set P=17000, Run.
 2. Type in MAFPRT to supervisor on the 2741. Message MAFPRT IS IN will appear on the 2260.
 3. At GIF keyboard, type PR,FWA,LWA; for each section of core to be dumped. After each dump, at the 2260, type MORE to do another section of core or QUIT to terminate MAFPRT. FWA and LWA are octal addresses. Only those between 0 and 16777 are meaningful.
 4. To restore the transmission program, enter command RD,17000,17300,17700;.
 5. Load desired program from the drum

Appendix A

#	DECIMAL TO OCTAL DRUM TRACK ADDRESSES									
	0	1	2	3	4	5	6	7	8	9
000	00000	00040	00100	00140	00200	00240	00300	00340	00400	00440
010	00500	00540	00600	00640	00700	00740	01000	01040	01100	01140
020	01200	01240	01300	01340	01400	01440	01500	01540	01600	01640
030	01700	01740	02000	02040	02100	02140	02200	02240	02300	02340
040	02400	02440	02500	02540	02600	02640	02700	02740	03000	03040
050	03100	03140	03200	03240	03300	03340	03400	03440	03500	03540
060	03600	03640	03700	03740	04000	04040	04100	04140	04200	04240
070	04300	04340	04400	04440	04500	04540	04600	04640	04700	04740
080	05000	05040	05100	05140	05200	05240	05300	05340	05400	05440
090	05500	05540	05600	05640	05700	05740	06000	06040	06100	06140
100	06200	06240	06300	06340	06400	06440	06500	06540	06600	06640
110	06700	06740	07000	07040	07100	07140	07200	07240	07300	07340
120	07400	07440	07500	07540	07600	07640	07700	07740	10000	10040
130	10100	10140	10200	10240	10300	10340	10400	10440	10500	10540
140	10600	10640	10700	10740	11000	11040	11100	11140	11200	11240
150	11300	11340	11400	11440	11500	11540	11600	11640	11700	11740
160	12000	12040	12100	12140	12200	12240	12300	12340	12400	12440
170	12500	12540	12600	12640	12700	12740	13000	13040	13100	13140
180	13200	13240	13300	13340	13400	13440	13500	13540	13600	13640
190	13700	13740	14000	14040	14100	14140	14200	14240	14300	14340
200	14400	14440	14500	14540	14600	14640	14700	14740	15000	15040
210	15100	15140	15200	15240	15300	15340	15400	15440	15500	15540
220	15600	15640	15700	15740	16000	16040	16100	16140	16200	16240
230	16300	16340	16400	16440	16500	16540	16600	16640	16700	16740
240	17000	17040	17100	17140	17200	17240	17300	17340	17400	17440
250	17500	17540	17600	17640	17700	17740				

Appendix B

*****DRUM DIRECTORY*****

FAB 0611100 17 28 45 01

TRACK/SECTOR	FRM	TO	NAME	ENTRY POINT
15600-15640		7000	IDGP 9-28	1000
15700				
15740				
16000-16040	12000	16700	DTUT 9-28	13200
16100				
16140-16240	0	7777	SRLTPAT	1000
16300				
16340				
16400-16440	0	7000	GIDGP	1000
16500-16540	0	7000	IDGP 7-29	1000
16600	17300	17777	HIGH CORE BACKUP	
16640				
16700	0	4000	GO JUMP	
16740				
17000-17100	0	12000	DFA	1000
17140				
17200				
17204	17000	17300	SAVE CORE L/DTUT	17000
17210				
17214	20	347	INTERRUPT HAND.	
17220	16000	16000	ALT. TRANSMIT	16000
17224	16000	16000	DRUM DRIV. RD	13000 WR 13004
17230	17301	17400	DRUM READ	17301
17234				
17240	13000	16300	DTUT (OLD)	13200
17300	16000	16000	620/I DUMP	15000
17340	0	2455	DRUM DIAGS.	1
17400-17500	0	12000	RCBISP	1000
17540				
17600-17640	0	7000	IDIUM DIAGS.	4
17700	17000	17300	TRANSMIT	17000
17740				

0001
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