AUTOMATIC MAGNETIC TAPE CONTROL TYPE 510

sfc	720072	Skip if Tape Control Free
rsr	720172	Read State Register
crf	720272	Clear End-of-Record Flip-Flop
cpm	720472	Clear Proceed Mode
dur	72xx70	Load Density, Unit, Rewind
mtf	73xx71	Load Tape Function Register
cgo	720073	Clear Go

MULTIPLEXED A-D CONVERTER TYPE 138/139

rcb	720031	Read Converter Buffer
cad	720040	Convert a Voltage
scv	72mm47	Select Multiplexer (1 of 64 Channels)
icv	720060	Index Multiplexer

AUTOMATIC LINE PRINTER TYPE 64

clrbuf	722045	Clear Buffer
lpb	720045	Load Printer Buffer
pas	721x45	Print and Space

SKIP GROUP

sma	640400	Dkip on minus AC	5
spa	640200	Skip on plus AC	5
spi	642000	Skip on plus IO	5
sza	640100	Skip on ZERO (+0) AC	5
szf	6400f	Skip on ZERO flag	5
szo	641000	Skip on ZERO overflow (and clear overflow)	5
szs	6400s0	Skip on ZERO sense switch	5

SHIFT/ROTATE GROUP

ral	661	Rotate AC left	5
rar	671	Rotate AC right	5
rcl	663	Rotate Combined AC & IO left	5
rcr	673	Rotate Combined AC & IO right	5
ril	662	Rotate IO left	5
rir	672	Rotate IO right	5
sal	665	Shift AC left	5
sar	675	Shift AC right	5
scl	667	Shift Combined AC & IO left	5
scr	677	Shift Combined AC & IO right	5
sil	666	Shift IO left	5
sir	676	Shift IO right	5

Alphabetical Instruction List

INSTRUCTION	CODE	INSTRUCTION	CODE	INSTRUCTION	CODE
add	40	jsp	46	ril	66 2
and	02	jda	17	rir	67 2
asc	72 kn51	jmp	60	rlc	72 0366
cac	72 0053	jsp	62	rpa	72 0001
cad	72 0040	lac	20	rpb	72 0002
cal	16	lag	72 0044	rrb	72 0030
cbs	72 0056	lat	76 2200	rsk	72 0047
ccr	72 s067	law	70	rsr	72 0172
cgo	72 0073	lem	72 0074	sad	50
cks	72 0033	lio	22	sal	66 5
cla	76 0200	lpb	72 0045	sar	67 5
clf	76 000f	lsm	72 0054	sas	62
cli	76 4000	mcb	72 0070	sci	72 c157
clrbuf	72 2045	mcs	72 0034	scl	66 7
cma	76 1000	mel	72 u036	scr	67 7
cpm	72 0472	mes	72 u035	scv	72 mm47
crf	72 0272	mic	72 uc75	scw	72 c057
dac	24	mrc	72 0072	sdb	72 2007
dap	26	mrf	72 u067	sdf	72 0146
dio	32	mri	72 ug66	sfc	72 0072
dip	30	msm	72 0073	sft	66
div	56	mtf	73 xx71	sla	72 0346
dpp	72 0407	muf	72 uc76	sil	66 5
dpy	72 0007	mul	54	sir	67 6
dsc	72 kn50	mwc	72 0071	skp	72 2f45
dur	72 xx70	nop	76 0000	slp	72 2145
dzm	34	opr	76	sma	64 0400
eem	72 4074	pac	72 0043	spa	64 0200
esm	72 0055	pas	72 1x45	spi	64 2000
flb	72 1045	ppa	72 0005	stf	76 001f
glf	72 2026	ppb	72 0006	sub	42
gpl	72 2027	prl	72 0045	swc	72 x046
gpr	72 0027	ral	66 1	sza	64 0100
gsp	72 0026	rar	67 1	szf	64 000f
hlt	76 0400	rac	72 0041	szo	64 1000
icv	72 0060	rbc	72 0042	szs	64 00s0
idx	44	rcb	72 0031	tyi	72 0004
inr	72 ur67	rcc	72 0032	tyo	72 0003
ior	04	rcl	66 3	xct	10
iot	72	rcr	67 3	xor	06
isb	72 kn52	rdk	72 0037		

Numerical Instruction List

CODE	INSTRUCTION	CODE	INSTRUCTION	CODE	INSTRUCTION
00	*	64 2000	spi	72 kn52	isb
02	and	66	sft	72 0053	cac
04	ior	66 1	ral	72 0054	ism
06	xor	66 2	ril	72 0055	esm
10	xct	66 3	rcl	72 0056	cbs
12	*	66 5	sal	72 c057	scw
14	*	66 6	sil	72 ug66	mri
16	cal	66 7	scl	72 ur67	inr
17	jda	67 1	rar	72 5067	ccr
20	lac	67 2	rir	72 u067	mrf
22	lio	67 3	rcr	72 0070	mcb
24	dac	67 5	sar	72 0071	mwc
26	dap	67 6	sir	72 0072	mrc
30	dip	67 7	scr	72 0073	msm
32	dio	70	law	72 0074	lem
34	dzm	71	law -	72 uc75	mic
36	*	72	iot	72 ue76	muf
40	add	72 0001	rpa	72 c157	sci
42	sub	72 0002	rpb	72 0407	dpp
44	idx	72 0003	tyo	72 1045	flb
46	isp	72 0004	tyi	72 2f45	slp
50	sad	72 0005	ppa	72 4074	eem
52	sas	72 0006	ppb	76	opr
54	mul	72 0007	dpy	76 0000	nop
56	div	72 0030	rrb	76 000f	clf
60	jmp	72 0033	cks	76 001f	ztf
62	jsp	72 0034	msc	76 0100	lap
64	skp	72 u035	mes	76 0200	cla
64 000f	szf	72 u036	mel	76 0400	hlt
64 00s0	szs	72 0037	rdk	76 1000	cma
64 0100	sza	72 0045	prl	76 2200	lat
64 0200	spa	72 0047	rsk	76 4000	cli
64 0400	sma	72 kn50	dsc		
64 1000	szo	72 kn51	asc		

Alphnumeric Codes By Character

CHARACTER LOWER	CHARACTER UPPER	FIO-DEC CODE	CONCISE CODE
a	A	61	61
b	B	62	62
c	C	263	63
d	D	64	64
e	E	265	65
f	F	266	66
g	G	67	67
h	H	70	70
i	I	271	71
j	J	241	41
k	K	242	42
l	L	43	43
m	M	244	44
n	N	45	45
o	O	46	46
p	P	247	47
q	Q	250	50
r	R	51	51
s	S	222	22
t	T	23	23
u	U	224	24
v	V	25	25
w	W	26	26
x	X	227	27
y	Y	230	30
z	Z	31	31

CHARACTER LOWER	CHARACTER UPPER		FIO-DEC CODE	CONCISE CODE
0	→	(right arrow)	20	20
1	“	(double quotes)	01	01
2	‘	(single quote)	02	02
3	~	(not)	203	03
4	⊃	(implies)	04	04
5	∨	(or)	205	05
6	∧	(and)	206	06
7	<	(less than)	07	07
8	>	(greater than)	10	10
9	↑	(up arrow)	211	11
(	[		57	57
)_	]		255	55
	|	(non-spacing overstrike and vertical)	256	56
-	+	(minus and plus)	54	54
•	_	(non-spacing middle dot and underline)	40	40
,	=		233	33
.	×	(period and multiply)	73	73
/	?		221	21

	FIO-DEC CODE	CONCISE CODE
Lower Case	272	72
Upper Case	274	74
Space	200	00
Backspace	75	75
Tab	236	36
Carriage Return	277	77
Tape Feed	00	00
Red *	-	35
Black *	-	34
Stop Code	13	-
Delete	100	-

* Used on Type-Out only, not on keyboard

Alphanumeric Codes By Concise Codes

CONCISE CODE	FIO-DEC CODE	CHARACTER LOWER	CHARACTER UPPER	CONCISE CODE	FIO_DEC CODE	CHARACTER LOWER	CHARACTER UPPER
00	00	Tape	Feed	41	241	j	J
-	100	Delete		42	242	k	K
00	200	Space		43	43	l	L
01	01	1	“	44	244	m	M
02	02	2	‘	45	45	n	N
03	203	3	~	46	46	o	O
04	04	4	⊃	47	247	p	P
05	205	5	∨	50	250	q	Q
06	206	6	∧	51	51	r	R
07	07	7	<	54	54	-	+
10	10	8	>	55	255	)_	]
11	211	9	↑	56	256		|
-	13	Stop	Code				
20	20	0	→	57	57	(	[
21	221	/	?	61	61	a	A
22	222	s	S	62	62	b	B
23	23	t	T	63	263	c	C
24	224	u	U	64	64	d	D
25	25	v	V	65	265	e	E
26	26	w	W	66	266	f	F
27	227	x	X	67	67	g	G
30	230	y	Y	70	70	h	H
31	31	z	Z	71	271	i	I
33	233	,	=	72	272	Lower	Case
34	-	black *		73	73	.	×
35	-	red *		74	274	Upper	Case
36	236	tab		75	75	Backspace	
40	40	•	_	77	277	Carriage	Return

* Used on Type-Out only, not on keyboard

Character Set for DEC Type 64 Line Printer

CHARACTER SEQUENCE AND CODE (OCTAL)	CHARACTER	CHARACTER SEQUENCE AND CODE (OCTAL)	CHARACTER
		40	•
1	1	41	J
2	2	42	K
3	3	43	L
4	4	44	M
5	5	45	N
6	6	46	O
7	7	47	P
10	8	50	Q
11	9	51	R
12	‘	52	space
13	~	53	=
14	⊃	54	-
15	∨	55	)_
16	∧	56	
17	<	57	(
20	0	60	
21	/	61	Ā
22	S	62	B
23	T	63	C
24	U	64	D
25	V	65	E
26	W	66	F
27	X	67	G
30	Y	70	H
31	Z	71	I
32	“	72	×
33	,	73	.
34	≥	74	+
35	↑	75	]
36	→	76	|
37	?	77	[

Octal To Decimal Integer Conversion Table

OCTAL	DECIMAL	OCTAL	DECIMAL
1	1	1000	512
2	2	2000	1024
3	3	3000	1536
4	4	4000	2048
5	5	5000	2560
6	6	6000	3072
7	7	7000	3584
10	8	10000	4096
20	16	20000	8192
30	24	30000	12288
40	32	40000	16384
50	40	50000	20480
60	48	60000	24576
70	56	70000	28672
100	64	100000	32768
200	128	200000	65536
300	192	300000	98304
400	256	400000	131072
500	320	500000	163840
600	384	600000	196608
700	448	700000	229376

Note: On the PDP-1 400000_8 to 700000_8 are negative integers with conversions listed below:

400000	-131071
500000	-98303
600000	-65535
700000	-32767

Table Of Powers Of Two

2^n	n	2^{-n}
1	0	1.0
2	1	0.5
4	2	0.25
8	3	0.125
16	4	0.062 5
32	5	0.031 25
64	6	0.015 625
128	7	0.007 812 5
256	8	0.003 906 25
512	9	0.001 953 125
1 024	10	0.000 967 562 5
2 048	11	0.000 488 281 25
4 096	12	0.000 244 140 625
8 192	13.	0.000 122 070 312 5
16 384	14	0.000 061 035 156 25
32 768	15	0.000 030 517 578 125
65 536	16	0.000 015 258 789 062 5
131 072	17	0.000 007 629 394 531 25
262 144	18	0.000 003 814 697 265 625
524 288	19	0.000 001 907 348 632 812 5
1 048 576	20	0.000 000 953 674 316 406 25
2 097 152	21	0.000 000 476 837 158 203 125
4 194 304	22	0.000 000 238 418 579 101 562 5
8 388 608	23	0.000 000 119 209 289 550 781 25
16 777 216	24	0.000 000 059 604 644 775 390 625
33 554 432	25	0.000 000 029 802 322 387 695 312 5
67 108 864	26	0.000 000 014 901 161 193 847 656 25
134 217 728	27	0.000 000 007 450 580 596 923 808 125
268 435 456	28	0.000 000 003 725 290 298 461 914 062 5
536 870 912	29	0.000 000 001 862 645 149 230 957 031 25
1 073 741 824	30	0.000 000 000 931 322 574 615 478 515 625
2 147 483 848	31	0.000 000 000 465 661 287 307 739 257 812 5
4 294 967 296	32	0.000 000 000 232 830 643 653 869 628 906 25
8 589 934 592	33	0.000 000 000 116 415 321 826 934 814 453 125
17 179 869 184	34	0.000 000 000 058 207 660 913 467 407 226 562 5
34 359 738 368	35	0.000 000 000 029 103 830 456 733 703 613 081 25
68 719 476 736	36	0.000 000 000 014 551 915 228 366 851 806 640 625
137 438 953 472	37	0.000 000 000 007 275 957 614 183 425 903 320 312 5
274 877 906 944	38	0.000 000 000 003 637 978 807 091 712 951 660 156 25
549 755 813 888	39	0.000 000 000 001 818 989 403 545 856 475 830 078 125
1 099 511 627 776	40	0.000 000 000 000 909 494 701 772 928 237 915 039 062 5
2 199 023 255 552	41	0.000 000 000 000 454 747 350 886 464 118 957 519 531 25
4 398 046 511 104	42	0.000 000 000 000 227 373 675 443 232 059 478 759 765 625
8 796 093 022 208	43	0.000 000 000 000 113 686 837 721 616 029 739 379 882 812 5
17 592 186 044 416	44	0.000 000 000 000 056 843 418 860 808 014 869 689 941 406 25
35 184 372 088 832	45	0.000 000 000 000 028 421 709 430 404 007 434 844 970 703 125
70 368 744 177 664	46	0.000 000 000 000 014 210 854 715 202 003 717 422 485 351 562 5
140 737 488 355 328	47	0.000 000 000 000 007 105 427 357 601 001 858 711 242 675 781 25
281 474 976 710 656	48	0.000 000 000 000 003 552 713 678 800 500 929 355 621 337 890 625
562 949 953 421 312	49	0.000 000 000 000 001 776 356 839 400 250 464 677 810 668 945 312 5
1 125 899 906 842 634	50	0.000 000 000 000 000 888 178 419 700 125 232 338 905 334 472 656 25
2 251 799 813 985 248	51	0.000 000 000 000 000 444 089 209 850 062 616 169 452 667 236 328 125
4 503 599 627 370 496	52	0.000 000 000 000 000 222 044 604 925 031 308 084 726 333 668 164 062 5
9 007 199 254 740 992	53	0.000 000 000 000 000 111 022 302 462 515 654 042 363 166 834 582 031 25
18 014 398 509 481 984	54	0.000 000 000 000 000 055 511 151 231 257 827 021 171 513 417 041 015 625
36 028 797 018 963 968	55	0.000 000 000 000 000 027 755 575 615 628 913 510 590 791 708 520 507 812 5
72 057 594 037 927 936	56	0.000 000 000 000 000 013 877 787 807 814 456 755 215 395 854 260 253 906 25
144 115 188 075 855 872	57	0.000 000 000 000 000 006 938 893 903 907 228 377 647 697 927 130 126 953 125
288 230 376 151 711 744	58	0.000 000 000 000 000 003 469 446 951 953 614 188 823 848 963 565 063 476 562 5
576 460 752 303 423 488	59	0.000 000 000 000 000 001 734 723 475 976 807 094 411 924 481 782 531 738 281 25
1 152 921 505 606 846 976	60	0.000 000 000 000 000 000 867 361 737 988 403 547 205 962 240 891 265 869 140 625