12. P E T 4

1. Explanation of the sockets.

INT
VCC
EXT

Is the power supply from the machine to be used for the panel (normal operation), then the short circuiting bridge which is delivered with the machine, should be plugged between "INT" and "VCC".
Is an external voltage regulator to be used, then the short circuiting bridge should be plugged between "EXT" and "VCC".

VCC-EXT
GND

The voltage regulator should also be connected with the + (positive clamp) to the "VCC-EXT" and with the - (negative clamp) connected to "GND". The supply voltage should be + 5 volts ± 5%. The "GND" socket is the Earth terminal with respect to the signal sockets.

CP1-T
CP2-T

CP1-T delivers a positive trigger impulse of ca. 8 us pulse width, when the machine programme, which is one the address switches of the Stop 1-addresses, is fed in. Which means, that the Stop 1 switch must be in the basic position, furthermore the selected address must be within the M1 cycle.
For CP2-T, the same applies with reference to the Stop 2 addresses.

STP-EXT

Zero potential on this signal input, brings the system into a Wait-State. The micro-programme is interrupted.

2. Explanation of the switches and keys.

Remarks:

All switches (red) and all keys (black) have a preference (basic) position, into which they especially lightly switch.
Is the panel connected to the machine and are all the keys and switches in this (basic) position, then the free running of the machine through the panel should not be interrupted.
One can see, visually by means of the flickering indicator lamps, that the machine is running.

RESET

By means of the "RESET" key, the system can be re-storted. The machine starts again with the programme step 0 (address 0).

CYCLE

Is this switch activated, the system is interrupted. The programme remains in a Wait-State. This Wait-State can be in the 1st, 2nd or 3rd cycle of a command.

START — With the "START" key the programme can be followed, stepwise (cyclewise) as long as one has left the Wait-State (CYCLE-Switch activated). Furthermore one can, with this command, leave a started address which has been stopped or in the DMA-Fall, can switch the internal address counter further.

STOP1
STOP2 — These switches, when in the normal position, mean that the system does not follow an eventual STOP address (by means of the Address-Bit-Switch). On the sockets CP1-T and CP2-T a trigger pulse can be taken, as long as the programme of the set address travels and this lies in a M1 cycle.
Is the STOP switch activated, then the system remains at the set address (in the Wait-State) as long as the programme has reached the STOP address.

Address switch AØ-A15 — By means of these switches, the respective STOP and Trigger addresses between 0 and 64K can be selected, both at the same time (STOP1-TRIG1/STOP2-TRIG2).
With the switches in the normal position ADDRESSBIT "LOW"
With the switches in the working position ADDRESSBIT "HIGH"
With the address switch row 2 (STOP2), the addresses for "DMA" operation can be set.

DMA — With this switch one effects the so called "DMA" operation (DIRECT MEMORY ADDRESS). Is this switch activated, then the CPU carries out the current command and goes eventually into the so called TRI-STATE. This means, that the memory media which are contained in the machine are separated from the CPU and can be directly utilized from the panel.
This allows the memory contents to be read directly from the panel and also allows the accessible contents to be changed without using the CPU. If one leaves the HOLD-STATE in that the "DMA" switch is brought again into the normal position, then the CPU continues the programme from the point where it was interrupted.

MEM-I/O — This switch controls the DMA-Fall, if the DMA is to be made from the memory or with the I/O-PORTS.

WRITE — Is this switch in the normal position, this means that in the DMA-Fall, from the memory or I/O PORT is being read. If one switches into the WRITE position, so is in the addressed byte every Data bit pattern written, which is selected by means of the Data bit switch DØ-D7, the precondition is however, that the address selected is in the accessible memory range (RAM) of the system or an OUTPUT-PORT with LATCH quality is addressed.

3. Explanation for the Indicator lamps (LED)

ADDRESS LAMPS AØ-A15	Indicate the immediate condition of the Addressingbus. Illuminated LED means Address Bit "HIGH". Non-illuminated Address Bit "LOW". A plottable value of the indication is only available, when the system is in the waiting condition (Wait or Halt-State, DMA).
DATA-LAMPS DØ-D7	Show the condition of the DATABUS. Otherwise the conditions are the same as for the ADDRESS lamps.
CPU-STATUS LAMPS	Show the momentary condition of the CPU.
WAIT	The CPU is in the "WAIT-STATE". The system is conditioned and waits.
WR	The LED shows, that the CPU is in the transmit condition (e.g. writing into the memory)
DPIN	The CPU is switched to receive. The Data flows into the CPU, when the LED lights.
DMA	The illuminated LED shows that the CPU is in the TRI-STATE (HOLD-) condition.
INTE	The INTE-LED shows when the CPU can accept an INTERRUPT signal.
SYSTEM-STATUS LAMPS	Show the momentary condition of the system.
MEMW	Is this lamp illuminated, then information is being written into the memory.
MEMR	Is this lamp illuminated, then is the system in the Memory read cycle.
IOW	Is this LED illuminated, then information is being written in an OUTPUT-PORT.
IOR	The LED illuminates, when an INPUT-PORT is an Interrogate.

M1 Is this LED illuminated, then is the system in the 1.byte command condition. This is always a Memory-Read cycle.
This means that the LED's "MEMR" and "DBIN" will also be illuminated.

STACK The STACK-LED shows that the system is in a STACK-CYCLE. Normally in the STACK, return addresses are stored.

INTA This LED shows, when after an INTERRUPT, this is recognized and accepted by the CPU.

MAGNETIC TAPE COMMANDS

Mnemo Code	OP Code	I	II	III	IV	V	Number of Groups
OPI	48	g	ia	vr			3
OPO	49	g	ia	vr			3
GET	50	g	ia	cp			6
-	-	ia	r	b			
PUT	51	g	ia	cp			6
-	-	ia	r	b			
SEK	52	g	ia	vr			3
MRK	53	g	ia	vr			3
SKP	54	g	ia	cp			3
CLS	56	g	ia	vr			3
ERS	57	g	s				2
BCK	60	g	ia	vr			3
OBO	61	g	ia	vr			3
OBI	62	g	ia	vr			3

LEDGER CARD COMMANDS

OPN	48	g	ia	vr			3
GET	50	g	ia	cp			6
-	-	ia	r	b			
PUT	51	g	ia	cp			6
-	-	ia	r	b			
TLM	52	g	zp				2
TLN	53	g	zp				2
LFL	54	g	ia	fl			3
LLJ	55	g	ia	sp			3

REP-COMMAND FOR MAGNETIC TAPE AND LEDGER CARDS

Mnemo Code	OP Code	I	II	III	IV	V	Number of Groups
REP	59	g	ia	vr			3

BASIC MACHINE COMMANDS

Mnemo Code	OP Code	I	II	III	IV	V	Number of Groups
TRV	00	-	ia	vr			3
BRV	01	*	ia	vr			3
ADD	02	-	ia	vr			3
MUL	03	sr	vr				2
NUR	04	sr	vr				2
MVD	05	dc	vr				2
MVR	06	dc	vr				2
TST	08	ac	x	cp			2 or 3
DIV	09	sl	vr				2
SHL	10	sl	vr				2
SHR	11	sr	vr				2
CCN	12	-	ai	co	co		3 or 4
OPS	13	0	n	m			1,2 or 3
JUN	16	ps					1
JM1	17	ps					1
JM2	18	ps					1
JM3	19	ps					1
JM4	20	ps					1
JM5	21	ps					1
JM6	22	ps					1
JMS	24	ps					1
RET	25	u	<=>	m	f	lv	4 or 5
JME	26	ps					1
JML	27	ps					1
JMM	23	ps					1
SET	29	m	1				2
RST	30	m	1				2
WAK	32	cp	ai	ky			3
MAK	33	cp	m	ky			3
MAT	34	ac	ia	vr			3
OUP	40	nu	vu	vk	th	tl	5
OUT	41	sy	nk	cp			3
PRA	42	cp	vr				2
ACP	43	ia	kl	cp			3
TAB	45	j1/j2	pc				2
LIN	46	j1/j2	↓	lc			3
COL	47	j1/j2	sp	fl			3
NOP	63	0					1
MVA	07	ia	cp				
-	-	ia	r	b			8
-	-	ia	r	b			
CPA	35	ia	cp				
-	-	ia	r	b			8
-	-	ia	r	b			
PRL	36	ia	cp				
-	-	ia	r	b			5
PCK	38	ia	cp				
-	-	ia	r	b			5
UPK	39	sy	nk	cp			
-	-	ia	r	b			6
ACS	44	ia	np	cp			
-	-	ia	r	b			6

Explanation of the Abbreviations

- \- = Negative
- * = Total
- => = (For marker) <=>
- ↓ = Line feed forword (platen)
- ac = Accu (data memory 0)
- ai = Alpha input
- b = Byte address (0 - 3071)
- co = Constant
- cp = Capacity (max. 255)
- dc = Decade
- f = Error routine
- fl = Form lenght (max 112)
- g = Device number (0 - 3)
- ia = Indirect addressing
- j1 = 1st EF
- j2 = 2nd EF
- j1/j2 = Platen (SE); 3rd EF (needle printer)
- kl = Small letter (SE Single Element)
- ky = Start key (1 - 6)
- l = Lamp (1 - 4)
- lc = Line feed
- lv = Subroutine levels (max.4)
- m = Marker (1 - 6)
- n = Standard print
- nk = Decimal points
- np = Not printing
- nu = Zero suppression / che
- 0 = OCR print
- pc = Position counter (max. 192)
- ps = Programme step (0-1023)
- r = Data progr.memory area
- s = Clear 1m Tape on MBK
- sl = Rounding off (max.15)
- sp = Jump line
- sr = Deduction (max.15)
- sy = Symbol
- th = Highest separator
- tl = Lowest separator
- u = And combination
- vk = Pre-decimal points
- vr = Data memory
- vu = Pre- sign suppression
- x = Auxiliary cell 1 or 2
- zp = Line position (0-2)