

tm

Dear Pascal MICROENGINE Single Board Computer Customer:

Congratulations on your selection of the Pascal MICROENGINE Single Board Computer. This product represents the latest advance in microprocessor systems technology: hardware designed for efficient high performance execution of Pascal programs.

Enclosed with your board should be the following literature:

Installation Guide Warranty Statement Registration Form Error Report Form

Additional information which may be of assistance to you is contained in the WD/90 Pascal MICROENGINE Reference Manual. If you currently do not have a copy, the manual may be purchased from Western Digital for \$19.95. The Pascal Operating System Diskette is also available in either standard 8", single or double density, single or double sided for \$25.00. Purchase orders or telephone orders should be directed to the Sales Department.

IN ORDER TO ENSURE THAT YOUR WARRANTY IS VALID, YOU MUST COMPLETE THE REGISTRATION FORM IMMEDIATELY. The warranty is described in the enclosed Warranty Statement, and lasts for ninety (90) days after purchase. Once you have completed the Registration Form, you will be put on The Microengine Company Mailing List.

If you have ordered the Pascal Operating System Diskette and with to continue to receive Pascal system software updates past the warranty period, please check the box marked MICROENGINE UPDATE SERVICE on the Registration Form. The service includes new releases of the UCSD Pascal software. The Microengine Company will bill you a basic charge of \$25.00 per release (after your warranty expires). To maintain your subscription, the invoice must be paid within ten (10) days after receipt.

A Subsidiary of WESTERN DIGITAL

3128 Red Hill Avenue, Box 2180, Newport Beach California 92663 (714) 557-3550, TWX 910-595-1139

Page -2-

Should you experience problems after your warranty period, you may return your Single Board Computer to The Microengine Company for repair. The current repair price for boards which have not been subjected to abnormal conditions is \$175.

If your board is nonfunctioning and you wish to take advantage of The Microengine Company's repair program, you should call Microengine Technical Support. Send the malfunctioning unit, freight prepaid, to:

> The Microengine Company Repair Service 3128 Red Hill Avenue Costa Mesa, California 92626

Your repaired Single Board Computer will be shipped to you freight collect from Costa Mesa.

Thank you for your confidence in the Pascal MICROENGINE.

Sincerely,

The Microengine Company



Dear Pascal MICROENGINE User:

The following documentation is provided to help you configure your Pascal MICROENGINE System.

- 1. Procedure to properly configure the system.
- 2. Wire lists for the Centronics Series 700 line printers, Shugart SA800/SA850 and Remex 4000-A floppy disk drives and the system terminal.
- 3. Charts of the recommended options to be installed in the floppy disk drives and diagrams of where options are located.
- 4. List of the responses to the SETUP program for the SOROC IQ 120 and Beehive 150 terminals.
- 5. Procedure for duplicating the operating system diskette.

80-013003-00A1 Installation Guide

A Subsidiary of WESTERN DIGITAL

3128 Red Hill Avenue, Box 2180, Newport Beach California 92663 (714) 557-3550, TWX 910-595-1139

To configure a Pascal MICROENGINEtm System the following procedure should be followed:

- Cables for the floppy disk drive, system terminal and line printer (if one is to be interfaced to the Microengine) must be made. Wire lists for these peripherals are given on page 1-2 of this document. Be sure to note the terminal wire list as it is not a standard CRT cable.
- 2. The floppy disk drives should have the recommended options installed. Option charts for various drives can be found starting on page 2-1 of this document.
- 3. The Pascal MICROENGINE option switches must be set. Refer to the WD/90 Pascal MICROENGINE Reference Manual. In the first half of that manual containing the Pascal MICROENGINE Computer User's Manual, the proper setting of the floppy disk and baud rate switches is described in Section 2.
- 4. Connect the floppy disk drive(s), system terminal and line printer to the Microengine. Refer to Section 2.2 of the Pascal MICROENGINE Computer User's Manual.
- 5. Start the system. Section 3 of the Pascal MICROENGINE Computer User's Manual describes starting the system. If a SOROC IQ 120/IQ 140 terminal (the operating system is configured for the SOROC) is being used as the system terminal, the operating system should announce itself in the top left-hand corner of the terminal's screen and the command prompt line should be displayed across the top of the screen. If another terminal is being used, then the prompt lines may be misplaced. The software will have to be modified to meet the specification of that terminal. The SETUP program, on the operating system diskette, can be run to configure the software to the terminal being used. In the second half of the WD/90 Pascal Reference Manual containing the Pascal MICROENGINE Computer Pascal Operations Manual, the SETUP program is described in Section 4. Responses to the SETUP program for various terminals are given starting on page 3-1 of this document. Before running SETUP, make a duplicate copy of the operating system diskette for back-up. The procedure for duplicating the diskette starts on page 4-1 of this document.
- 6. If, after running SETUP, the system terminal does not appear to be displaying properly, then it is possible that the cursor addressing for the terminal being used is different than that of the SOROC. In this case, a GOTOXY procedure must be created, compiled and bound into the system software. Section 4.9 of the Pascal MICROENGINE Computer Pascal Operations Manual describes the execution of the BINDER program and gives an example of a GOTOXY procedure.
- 7. After the operating system software is configured for the terminal you are using, make another copy of the reconfigured operating system for back-up.



tm

Dear Pascal MICROENGINE Single Board Computer Customer:

Congratulations on your selection of the Pascal MICROENGINE Single Board Computer. This product represents the latest advance in microprocessor systems technology: hardware designed for efficient high performance execution of Pascal programs.

Enclosed with your board should be the following literature:

Installation Guide Warranty Statement Registration Form Error Report Form

Additional information which may be of assistance to you is contained in the WD/90 Pascal MICROENGINE Reference Manual. If you currently do not have a copy, the manual may be purchased from Western Digital for \$19.95. The Pascal Operating System Diskette is also available in either standard 8", single or double density, single or double sided for \$25.00. Purchase orders or telephone orders should be directed to the Sales Department.

IN ORDER TO ENSURE THAT YOUR WARRANTY IS VALID, YOU MUST COMPLETE THE REGISTRATION FORM IMMEDIATELY. The warranty is described in the enclosed Warranty Statement, and lasts for ninety (90) days after purchase. Once you have completed the Registration Form, you will be put on The Microengine Company Mailing List.

If you have ordered the Pascal Operating System Diskette and with to continue to receive Pascal system software updates past the warranty period, please check the box marked MICROENGINE UPDATE SERVICE on the Registration Form. The service includes new releases of the UCSD Pascal software. The Microengine Company will bill you a basic charge of \$25.00 per release (after your warranty expires). To maintain your subscription, the invoice must be paid within ten (10) days after receipt.

A Subsidiary of WESTERN DIGITAL

3128 Red Hill Avenue, Box 2180, Newport Beach California 92663 (714) 557-3550, TWX 910-595-1139 Should you experience problems after your warranty period, you may return your Single Board Computer to The Microengine Company for repair. The current repair price for boards which have not been subjected to abnormal conditions is \$175.

If your board is nonfunctioning and you wish to take advantage of The Microengine Company's repair program, you should call Microengine Technical Support. Send the malfunctioning unit, freight prepaid, to:

> The Microengine Company Repair Service 3128 Red Hill Avenue Costa Mesa, California 92626

Your repaired Single Board Computer will be shipped to you freight collect from Costa Mesa.

Thank you for your confidence in the Pascal MICROENGINE.

Sincerely,

۰.

The Microengine Company



Dear Pascal MICROENGINE User:

The following documentation is provided to help you configure your Pascal MICROENGINE System.

- 1. Procedure to properly configure the system.
- 2. Wire lists for the Centronics Series 700 line printers, Shugart SA800/SA850 and Remex 4000-A floppy disk drives and the system terminal.
- 3. Charts of the recommended options to be installed in the floppy disk drives and diagrams of where options are located.
- 4. List of the responses to the SETUP program for the SOROC IQ 120 and Beehive 150 terminals.
- 5. Procedure for duplicating the operating system diskette.

80-013003-00A1 Installation Guide

A Subsidiary of WESTERN DIGITAL 3128 Red Hill Avenue, Box 2180, Newport Beach California 92663 (714) 557-3550, TWX 910-595-1139

To configure a Pascal MICROENGINEtm System the following procedure should be followed:

- Cables for the floppy disk drive, system terminal and line printer (if one is to be interfaced to the Microengine) must be made. Wire lists for these peripherals are given on page 1-2 of this document. Be sure to note the terminal wire list as it is not a standard CRT cable.
- 2. The floppy disk drives should have the recommended options installed. Option charts for various drives can be found starting on page 2-1 of this document.
- 3. The Pascal MICROENGINE option switches must be set. Refer to the WD/90 Pascal MICROENGINE Reference Manual. In the first half of that manual containing the Pascal MICROENGINE Computer User's Manual, the proper setting of the floppy disk and baud rate switches is described in Section 2.
- 4. Connect the floppy disk drive(s), system terminal and line printer to the Microengine. Refer to Section 2.2 of the Pascal MICROENGINE Computer User's Manual.
- 5. Start the system. Section 3 of the Pascal MICROENGINE Computer User's Manual describes starting the system. If a SOROC IQ 120/IQ 140 terminal (the operating system is configured for the SOROC) is being used as the system terminal, the operating system should announce itself in the top left-hand corner of the terminal's screen and the command prompt line should be displayed across the top of the screen. If another terminal is being used, then the prompt lines may be misplaced. The software will have to be modified to meet the specification of that terminal. The SETUP program, on the operating system diskette, can be run to configure the software to the terminal being used. In the second half of the WD/90 Pascal Reference Manual containing the Pascal MICROENGINE Computer Pascal Operations Manual, the SETUP program is described in Section 4. Responses to the SETUP program for various terminals are given starting on page 3-1 of this document. Before running SETUP, make a duplicate copy of the operating system diskette for back-up. The procedure for duplicating the diskette starts on page 4-1 of this document.

.

- 6. If, after running SETUP, the system terminal does not appear to be displaying properly, then it is possible that the cursor addressing for the terminal being used is different than that of the SOROC. In this case, a GOTOXY procedure must be created, compiled and bound into the system software. Section 4.9 of the Pascal MICROENGINE Computer Pascal Operations Manual describes the execution of the BINDER program and gives an example of a GOTOXY procedure.
- 7. After the operating system software is configured for the terminal you are using, make another copy of the reconfigured operating system for back-up.

WIRE LIST FOR CENTRONICS LINE PRINTER



 Recommended that these signals be routed via twist pair or ribbon cable with alternate grounds

WIRE LIST FOR FLOPPY DRIVES

Drive Cable REMEX, PERTEC, SHUGART	Function	J-4
2	TC 43	29
14	Side Select	4
. 18	HLD	23
26	DSELECTI	. 2
. 28	DSELECT2	21
30	DSELECT3	3
32	DSELECT4	22
34	Direction	25
36	Step	6
38	עש	8
40	Write Gate	27
20	INDEX	31
22	Ready	16
42	TRKO	12
46	Read Data	14
44	Write Protect	10
1	GND	1
5	GND	5
7	GND	7
9	GND	9
13	CND	13

Odd wires tied together (tie to conn. pins 15 & 17). Even wires cut back.

WIRE LIST FOR SYSTEM TERMINAL



(1-2)

SHUGART SA800 OPTION CHART

RECOMMENDED TRACE CONFIGURATIC DESIGNATION DESCRIPTION OPEN SHOR х* T3, T4, T5, T6 Terminations for Multiplexed Inputs T1Terminator for Drive Select Х т2 Spare Terminator for Radial Head Load Х X** Drive Select Input Pins DS1, DS2, DS3, DS4 Х RR Radial Ready Х Radial Index and Sector RI Ready, Index, Sector Alternate Output Pads х R,I,S HLStepper Power from Hard Load х Х DS Stepper Power from Drive Select X WP Inhibit Write when Write Protected NP Allow Write when Write Protected Х х D Alternate Input In 2, 4, 6, 8, 10, 12, 14, 16, 18 Nine Alternate I/O Pins Х Customer Installable Decode Drive Select D1, D2, D4, DDS Х х Radial Head Load Α Х в Radial Head Load Х Radial Head Load х С Alternate Input Head Load х Х \mathbf{Z} In Use from Drive Select Y In Use from HD LD Х Х DC Alternate Output-Disk Change

* Terminate the last drive on cable.** Jumper appropriate drive number.

(2-1)



Ma Jumper Plug Installed as Shipped

Test Point

i i

SA800/801 PCB Component Locations

(2-2)

SHUGART SA850 OPTION CHART

TRACE	DESCRIPTION	RE COMME CONFIGU	RECOMMENDED	
		OPEN	SHOR	
		. *		
ЗН	Terminations for Multiplexed Standard Inputs		Х*	
RD9	Pull Up for Multiplexed Optional Inputs			
DS1, DS2, DS3, DS4	Drive Select Input Pins		X*;	
1B, 2B, 3B, 4B	Side Select Option Using Drive Select	X		
RR	Radial Ready		Х	
RI	Radial Index and Sector		Х	
R	Option Shunt for Ready Output		x	
25	Two-Sided Status Output	Х		
850	Sector Option Enable	850		
I	Index Output		Х	
S	Sector Output		Х	
DC	Disk Change Option		Х	
HL	Stepper Power from Head Load	Х		
DS	Stepper Power from Drive Select		Х	
WP	Inhibit Write when Write Protected		х	
NP	Allow Write when Write Protected	х		
D	Alternate Input-In Use	Х		
D1, D2, D4, DDS	Decode Drive Select Option	х		
DD	Standard Drive Select Enable		х	
DL	Door Lock Latch Option		х	
А	Radial Head Load		х	
В	Radial Head Load		х	
х	Radial Head Load	х		
С	Alternate Input-Head Load		Х	
Z	In Use from Drive Select	х		
Y	In Use from Head Load	·	X	
S1	Side Select Option Using Direction Select	x	· : · ·	
S2	Standard Side Select Input		X	
S3	Side Select Option Using Drive Select	x		
TS, FS	Data Separation Option Select	FS	ŢS	
	TS = True Separation		. * *	
	FS = False Separation			

* Terminate the last drive on cable.** Jumper appropriate drive number.

÷







REMEX 4000-A OPTION CHART

S1

S2

S3

TS, FS

-5V, -15V

•			
TRACE		RECOMM	IENDED
DESIGNATION	DESCRIPTION	CONFIC	URATIO
		OPEN	SHOR
7A	Terminations for Multiplexed Inputs	•	X*
DS1, DS2, DS3, DS4	Drive Select Input Pins		X**
1B, 2B, 3B, 4B	Side Select Option Using Drive Select	х	
RR	Radial Ready		Х
RI	Radial Index and Sector		Х
R	Option Shunt for Ready Output		X
2 S	Two-Sided Status Output	X	
4000	Sector Option Enable		4000
I	Index Output		Х
S	Sector Output		X
DC	Disk Change Option		Х
HL	Stepper Power from Head Load	Х	
DS	Stepper Power from Drive Select		Х
WP	Input Write when Write Protected		Х
NP	Allow Write when Write Protected	х	
D	Alternate Input-In Use	х	
DL	Door Lock Latch Option		Х
А	Radial Head Load		Х
В	Radial Head Load		х
Х	Radial Head Load	х	
С	Alternate Input-Head Load		х
Z	In Use from Drive Select	х	
Y	In Use from Head Load		Х

Side Select Option Using Direction Select

Side Select Option Using Drive Select

Standard Side Select Input

TS - True Separation FS - False Separation

-5 Volt Supply Option

Data Separation Option Select

Х

Х

FS

Х

TS

Х

* Terminate the last drive on cable. ** Jumper appropriate drive number.



Trace and Jumper Locations for 2S, DC, C, D, TS, FS, DS1-DS4, 1B-4B, S1-S3.

(2-6)

e Station dels



Trace and Jumper Locations for DL, WP, NP, RI, RR, S, A, I, X, B, A, HL, Z, DS, Y. (2-7)

RESPONSE (DECIMAL)	RESPONSE (ASCII)
	:
FALSE	
FALSE	·
FALSE	
24	
80	
15	
	RESPONSE (DECIMAL) FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE 15

LIST OF RESPONSES TO THE SETUP PROGRAM

BEEHIVE 150

FIELD NAME	DECIMAL			ASCII	
				· .	
BACKSPACE	8			BS	
DISK READ RATE	Dependent	on Dis	k Speed -	see manual	(update)
DISK SEEK RATE	Dependent	on Disl	k Speed -	see manual	(update)
DISK WRITE RATE	Dependent	on Disl	k Speed -	see manual	(update)
EDITOR "ACCEPT" KEY	3			ETX	
EDITOR "ESCAPE" KEY	27			ESC	
ERASE LINE	/5			K .	
ERASE SCREEN	69 75			E	
ERASE TO END OF COPEN	75			K T	
ERASE TO END OF SCREEN	/4		DATCE	U	
			FALSE		
HAS LOUCK			TALSE		
HAS BANDOM CURSOR ADDRESSING			TRUE		
HAS SLOW TERMINAL			FALSE		
KEY FOR BREAK	0		1 mbbb	NUT.	
KEY FOR FLUSH	6			ACK	
KEY FOR STOP	19			DC3	
KEY TO DELETE CHARACTER	8			BS	
KEY TO DELETE LINE	127			DEL	
KEY TO END FILE	3			ETX	
KEY TO MOVE CURSOR DOWN	10			LF	
KEY TO MOVE CURSOR LEFT	8			BS	
KEY TO MOVE CURSOR RIGHT	12			FF	
KEY TO MOVE CURSOR UP	11			VT	
LEAD-IN CHAR FROM KEYBOARD	0			NUL	
LEAD-IN TO SCREEN	27			ESC	
MOVE CURSOR HOME	72			H	
MOVE CURSOR RIGHT	1.2			FF	
MOVE CURSOR UP	11			FT	
NON-PRINTING CHARACTER	63			?	
PREFIXED [DELETE CHARACTER]			FALSE		•
PREFIXED (EDITOR "ACCEPT" KEY]			FALSE		
PREFIXED [EDITOR "ESCAPE" KEY]			FALSE		•
PREFIXED LERASE LINE			TRUE		
PREFIXED (ERASE SCREEN)			TRUE	•	
PREFIXED LERASE TO END OF LINE			TRUE		
DEFITED LEV FOR BOEN			TRUE		
PREFIXED KEY FOR FLUGH			FALSE	. •	
PREFIXED LAET FOR FLODING CUBSOD DOWN			FALSE FALSE		
PREFIXED KEY FOR MOVING CURSOR LEFT			FALSE		
PREFIXED KEY FOR MOVING CURSOR RICHT		:	FALSE		
PREFIXED KEY FOR MOVING CURSOR UP			FALSE		
PREFIXED KEY FOR STOP			FALSE		

-

FIELD NAME

DECIMAL

(3-4)

ASCII

PREFIXED [KEY TO DELETE CHARACTER]	FALSE
PREFIXED KEY TO DELETE LINE	FALSE
PREFIXED KEY TO END OF FILE	FALSE
PREFIXED MOVE CURSOR HOME	TRUE
PREFIXED MOVE CURSOR RIGHT	FALSE
PREFIXED MOVE CURSOR UP	FALSE
PREFIXED NON-PRINTING CHARACTER	FALSE
SCREEN HEIGHT 24	
SCREEN WIDTH 80	
VERTICAL MOVE DELAY 15	

Procedure:

1.1.1

1. After powering the Microengine System, take the Pascal Operating System Diskette delivered with the the Microengine and place it in the floppy disk drive optioned as DS1 (Volume #4:).

Press the Reset button. This should load the UCSD Pascal Operating System from the diskette into the Microengine memory and execute it. The following should be displayed on the terminal screen:

Welcome OSXX to UCSD Pascal System 3.0 Current Date is dd-mm-yy

2. Assuming you have the above prompt you are now ready to make a back-up copy of the Operating System Diskette. The command prompt line should be at the top of the terminal screen:

Command: E(dit, R(un, F(ile, C(omp, L(ink, X(exute, A(ssem, D(ebug, ?

3. Type an "F" on the terminal keyboard. This invokes the Filer which contains commands used primarily for maintaining files on the floppy diskette. The following prompt line will appear on the top of the terminal screen:

Filer: G(et, S(ave, W(hat, N(ew, L(dir, R(em, C(hange, T(ran, D(ate, Q(ui

- 4. Place a preformatted blank diskette into the drive optioned as DS2 (Volume #5:).
- 5. Type a "T" to transfer from the Operating System diskette to the new diskette. The following prompt will appear:

Transfer what file?

6. Type a "#4:" to specify that a complete volume transfer is going to take place. The next prompt will be:

To where?

- 7. Type a "#5:" to specify that the volume is to be transferred to the new diskette. A message indicating that the transfer is completed will then be given. If this does not occur, proceed to the next step anyway to check for bad blocks.
- 8. Type a "?" to get the rest of the Filer commands. The following will be displayed:

Filer B(ad-blks, E(xt-dir, K(runch, M(ake, P(refix, V(ols, X(amine, Z(ero

(4 - 1)

9. Type a "B" to run a bad blocks scan on the new diskette. The following prompt will be displayed:

Bad blocks scan of what volume?

- 10. Type in "#5:". The blocks being tested will be displayed on the screen. Should the scan detect a bad block, it will list it as being bad. If this occurs, try another new diskette and continue from Step 4. If the scan is successful, the system will announce 0 bad blocks.
- 11. Type a "Q" to Q(uit the Filer. The command prompt should reappear at the top of the screen.
- 12. Type a "X" for eX(ecute. The following prompt will be displayed:

Execute what file?

Ľ

13. Type "BOOTER" to execute the BOOTER utility. This utility places a BOOTSTRAP on the diskette. The following prompt will appear:

Unit to write boot to 4,5,9,10 :

14. Type a "5". This prompt will then be displayed:

Unit boot is on 4,5,9,10 :

- 15. Type "4" to indicate the delivered system diskette. A message indicating that the bootstrap was transferred will then be displayed.
- 16. Remove the diskette in Unit 5 and keep it as a back-up should anything happen to the delivered operating system diskette. Do not keep the two diskettes in the system at the same time. They both have the same volume name as a result of the transfer and this can lead to problems if subsequent commands are given.

WESTERN DIGITAL CORPORATION Q A FINAL ACCEPTANCE FORM

ODEL # 90006B (CRG 3917) ERIAL # 1428 ATE 4/21/80 ESTED BY MP

RINTER PORT

;

PORT

;

PORT

.

OLD BOOT

OT BOOT

ISK COPY

ISK VERIFY

:

ISUAL INSPECT

PPROVED FOR SHIPPMENT

 $\begin{bmatrix} \begin{pmatrix} 2 & 4 \\ 0 & 2 \\$

CERTIFICATE OF WARRANTY

The MICROENGINE[™] Company (TMC) warrants its hardware against defects in materials and workmanship for a period of ninety (90) days from the date of shipment to Customer. During the warranty period, TMC will, at its option, repair or replace hardware which proves to be defective. TMC warrants that its software will execute its programming instructions when properly installed on the appropriate TMC hardware. TMC does not warrant that operation of TMC software will be uninterrupted or error free. During the warranty period, TMC will provide its normal Software Support Services, at no charge.

The foregoing warranty shall not apply to defects resulting from:

- 1. improper or inadequate maintenance;
- 2. non-TMC-supplied software or interfacing;
- 3. unauthorized modification or misuse;
- 4. operation outside of the environmental specifications for the product; or
- 5. improper site preparation.

This warranty is in lieu of all other warranties expressed or implied, including any warranty of merchantability or fitness for a particular purpose, and TMC neither assumes, nor authorizes any person or firm to assume for it, any other or further obligation or liability in connection with the sales, installation or use of any product. Under no circumstances shall TMC or any affiliate or TMC have any liability whatsoever for loss of use or for any indirect, incidental or consequential damages.

Please fill out and return Registration Form to TMC.



A Subsidiary of WESTERN DIGITAL

With MICKOENGINE Company	3128 Redhill Avenue, Box 2180 Newport Beach, CA. 92663 (714) 557-3550, TWX 910-595-1139 A Subsidiery of <i>WESTERN DIGITAL</i>	Problem Report	The second s Second second
Product Name Product No		Revision	
Product Type Hardware Software Documentation 			•
Description of Problem	•		
Reported By			• • • • • • • • • • • • • • • • • • •
Name			
Company			
Phone No		• • • • • • • • • • • • • • • • • • •	

the second term of the second s

÷

•

* * * * * *

.