] [**10 /// 10] [10 /// 10] [10 /// 10] [10 /// 10]** [**10 /// 10] [10 /// 10]** [**10 /// 10]** [**10 /// 10]** [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 /// 10]**] [**10 // 10]**] [**10 /// 10]**] [**10 // 10]] [10 // 10]] [10 // 10]] [10 // 10]] [**

U-4 Disc User Manual

H

Ī

H

'make it easy on yourself'



U-4 Disc User Manual

*

.

U-Microcomputers Ltd Winstanley Industrial Estate Long Lane Warrington Cheshire England	U-Microcomputers Inc 300 Broad Street Stamford Connecticut 06901 USA				
Tlx 629279 U-MICRO G	T1x 965999 0&S STI				
Tel 0925 54117	Tel 203 359 4236				

STD Tel 203 359 4236 T.Free 800 243 2475

Notice: This manual, the U-4DISC Card and the firmware supplied on the card are copyright (C) U-Microcomputers 1983.

.

Manual issue A.

U-4DISC USER MANUAL The U-4DISC is a cost effective way of connecting up to four Apple Disc II or Disc II compatible disc drives to an Apple II+, Apple //e or Apple compatible computer. It supplies both control signals, and power to the disc drive. Existing diskettes may be used without any change.

Introduction

÷

4

Contents

Introduction

Installation

Operation

Technical description

Appendix 1 Source code listing of driver

3

Appendix 2 Circuit diagram

Installation

The U-4DISC is simple to install but in case of difficulty consult your supplier.

- 1) Switch off the computer.
- 2) Remove lid.
- 3) Decide into which slots you are going to install the U-4 DISC main board (marked UFDC4) and auxillary board (see operation section). To just test things and in most cases anyway the main U-4 DISC board will go into slot 6 and the auxillary board into slot 5. NOTE: If only two drives are to be connected then the auxillary board need not be installed.
- 4) The auxillary board should be received already connected by cable to the main board. If it has been detached then connect it now if you wish to use the auxillary board. The wire from the auxillary board connected to the pad just below the word "FRONT" printed on the board should be connected as indicated in Figure 1.
- 5) Plug the main board into its chosen slot and then the auxillary board as indicated in Figure 2. The end of the auxillary board marked "FRONT" should be nearest the front (ie keyboard end) of the computer.
- 6) Now connect from 1-4 disk drives to the U-4 DISC main board. IMPORTANT - the cable should stick out at right angles from the card if the cable is correctly plugged in. IMPORTANT - the plug must also be correctly inserted eg displacing the connector to the right or left so that some pins are not plugged in will damage the card or disc drive. Refer to figure 4.
- 7) The card is now ready for use. On power up the disc drive attached to the connector marked "1" will switch on and attempt to boot a disc. To test the card just boot a DOS 3.3 disc.

5

Figl (a)

Paddle board

connections

Figl (b)

Disc cable

connection







Fig 2

,

Installation

Operation

The U-4 DISC card is designed to be completely compatible with Apple software written using DOS 3.3, UCSD or CP/M operating systems. Special or own written operating systems should also work satisfactorily provided their low level software operate in the same was as the above mentioned operating systems.

These operating systems refer to the physical disc drives by different nomenclature . DOS 3.3 allows any slots to be used by disc drives whereas PASCAL and CP/M reserve slots for functions. Table 1 relates the drive designations to connectors on the U-4 DISC. For example if your CP/M program says - "Put diskette in drive C:" this means put the disc in the drive connected to connector 3 of the U-4 DISC main board. To make it easy the connectors are marked aswell. For all ready written software the table and this explanation should be all you need to know.

However if you are writing new disk operating systems or enhancing existing ones beware that the U-4 DISC PROM is compatible but not the same inside. If your software enters at odd places things probably won't work. But don't despair. A source listing is given at the end of this manual.

Table 1 - Disc Designations

U-4 DISC Slot	AUXILLARY board slot	U-4 DISC connectors	DOS	3.3	UCSD	CP/M
6	5	1	S6,	D1	#4:	A:
		2	S6,	D2	#5 :	В:
		3	S5,	D1	#11 :	С:
		4	S5,	D2	#12	D:
5	4	1	S5,	D1		E:
		2	s5,	D2		F:
		3	s4,	D1		na
		4	s4,	D2		na

8

Technical Description

Introduction

The U-FDC4 disk controller card in conjunction with a small paddle card in an adjacent peripheral expansion slots enables the user to control up to 4 floppy disk drives and is completely compatible with the Apple II 16 sector disk format.

Operation

Each slot of the Apple II is assigned to two floppy disk drives and the purpose of the small jumper pcb is to connect the NIOSEL and NDEVSEL signals from another slot into the U-FDC4 card which is typically installed in slot 6. This enables the card to control a total of four drives.

These two jumpered signals are OR`ed with the NIOSEL and NDEVSEL signals that are direct into the U-FDC4 card by means of the two 74LS08 AND gates.

P2 is a 256 by 8 bit ROM which holds the Boot 0 program used by the computer monitor when the computer is switched on or reset. The monitor accesses this program at address CnOO which activates the NIOSEL line. The power to this ROM is conserved by the two pnp transistors which remove the $\pm 5v$. line from the ROM while NIOSEL is inactive.

The 556 is a dual timer. One half generates a reset pulse when power is applied, this signal is duplicating the reset signal generated on the main Apple II processor board. The other half is a monostable with a one second time constant. The output of this timer is used to enable the floppy drive motor and is constantly retriggered during a disk access which involves the transfer of many data bytes since data is accessed via NDEVSEL which is the timer trigger. The effect of this is to stop the drive motor and LED flashing on and off rapidly and also causes the motor to continue running for approx. one second after a disk access has been completed.

The 74LS74 D-type flip flop is set and reset by the jumpered NDEVSEL or the direct NDEVSEL and indentifies which two of the four drives is being accessed. The 74LS259 is an addressable latch driven off the lower four bits of the address bus and enabled motor directly via four phases 00 to 03. It also controls selection of one of two drives.

Q5 of the LS259 and Q of the LS74 are decoded by the 74LS139 to select one of four drives by the NENO to NEN3 signals.

The 74LS323 is a universal shift register operating as a parallel to serial register during a write cycle and as serial to parallel register during a disk read. Parallel data to or from this register is read or written by the Apple cpu over the data lines D0 to D7.

Data on the floppy disk is held in a complex encoded serial format. Pl and the 74LS174 form a state machine which either encodes the serial data from the LS323 during a write cycle or decodes during a read cycle. Pl is a 256 by 8 bit ROM which holds a series of encoding and decoding bit patterns.

Q6 and Q7 of the LS259 select either a read or write cycle and control the direction of operation of both shift register and the state machine. The pnp transistors powers down both of the state machine ic's. while no disk accesses are taking place.



BAST Deleter Files News 10 DEC CONTROLLER FRAND, DBJO OODE: D2 * THE FILeDAMD SUBLE FALSE OWDER 20 3 LIGHTS LIGHTS LIGHTS Derive Sublemanne	SOURCE FILE: D	ISC CONTROLI	ER PI	ROM						
0000 1 00000 00000 00000 00000 000000 000000 000000000000000000000000000000000000	NEXT OBJ	ECT FILE NAM	ME IS	DISC CONT	ROLLER PROM.OBJO	005C:	52 *	* THE FOLLOWING CODE IS ALSO		
FFR8 2 1081T ELD #1735 IFTRS THE STORE STORE 0002: 54 24 2001TABLE DOUTSTREP AND SD 0000112 00 1 100 FERS FERS	0000:	1	ORG	\$0000		0050:	53 *	USED AS A SUBROUT	INE BY THE	
00001742 020 17 FIRST B DYTES MUST BE 00011 05 MUST BEEL MAT BEC 00001742 02 100 #0001774, 001 (77, 1001	FF58:	2 IORTS	EQU	\$FF58		0050:	54 *	2ND STAGE BOOTSTR	AP AND SO	
0000140 0000140 <t< td=""><td>0000:A9 20</td><td>3</td><td>LDA</td><td>#\$20</td><td>FIRST 8 BYTES MUST BE</td><td>005C:</td><td>55 *</td><td>MUST BEGIN AT \$5</td><td>C · ·</td></t<>	0000:A9 20	3	LDA	#\$20	FIRST 8 BYTES MUST BE	005C:	55 *	MUST BEGIN AT \$5	C · ·	
0004104 03 0004104 02 0004105 02 00004105 02 0004105 02 0004105 02 0004105 02 0004105 0	0002:A2 00	4	LDX	#\$00	;\$20,\$??.\$00,\$??.\$03,\$??.\$3C	005C:A9 00	56	LDA #0		
Concerned STV SEC DOWNINGLATY PUILD Read Parts Object of the second of th	0004:A0 03	5	LDY	#\$03	TO SATISFY AUTOSTART ROM	005E:85 26	57	STA \$26		
0008:00 9008:00 9008:00 9008:00 9008:00 0008:00 9008:00 0008:00 9008:00 0008:00 9008:00 0008:00 9008:00 0008:00 9008:00 <t< td=""><td>0006:84 3C</td><td>6 L1</td><td>STY</td><td>\$3C</td><td></td><td>0060:85 40</td><td>58</td><td>STA \$40</td><td></td></t<>	0006:84 3C	6 L1	STY	\$3C		0060:85 40	58	STA \$40		
0004495 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 000419 0 </td <td>0008:06 3C</td> <td>7</td> <td>ASL</td> <td>\$3C</td> <td>DYNAMICALLY BUILD READ TRANSLATE</td> <td>0062:88</td> <td>59 L5</td> <td>CLV</td> <td>;TO \$800 UPWARDS</td>	0008:06 3C	7	ASL	\$3C	DYNAMICALLY BUILD READ TRANSLATE	0062:88	59 L5	CLV	;TO \$800 UPWARDS	
U006:93 B TYA TTALLE IN MEMORY FROM 42CD UNARDB 004010 PB 61 DFL LG UMERN 1, DATA EVTE PRESENT 00001812 SC 9 AND #SC 10 methods 96 42 L7 DM #SC 10 methods <						0063:BD 8C CO	60 L6	LDA \$COBC,X	;WATCH READ DATA LATCH BIT 7	
0000125 3C 9 AND SC IF OR CONVENTING DISC SYTES TO IMALES FLAME 000019 0	000A:98	8	TYA		;TABLE IN MEMORY FROM \$3CD UPWARDS	0066:10 FB	61	BPL L6	;WHEN 1,DATA BYTE PRESENT	
0000F10 11 10 BED L3 16-BTT HEXTHI TABLE 15 ARRANGED 004010 F7 63 DME L4 INU,REF LOURING 0000F178 11 DTA STAT HE VALUE TO THE USLE DIFFE 004710 D 64 L5 INU,REF LOURING 0011427 TA DTA STAT HE VALUE TO THE USLE DIFFE 004710 D 64 L5 INU,REF LOURING 0011427 TA DTA STAT HE VALUE TO THE USLE DIFFE 004710 D 64 L5 HA INU,REF LOURING 0011427 TA NA HTO DETAIN THE VOLUCENT HEX CLOUR 007110 F5 67 HA INU,REF LOURING INU,REF LOURING 001149 SO IN STA STA HA INT REDOND NOTE OF 72 BC L0 HA HEADERS HEADERS HADDRESS HEADERS HAD	000B:25 3C	9	AND	\$3C	FOR CONVERTING DISC BYTES TO	0068:C9 D5	62 L7	[*] CMP #\$D5	;IS IT START OF HEADER?	
000F:98 11 TVA TSD THAT THE VALUE OF THE DISC PTM 000F:10 BC CBL, X POSSILLY, MAT'S NEXT? 0012:05 12 DRA \$5.2 ICAN BE USED DIRECTLY AS A MODIFIER 000F:10 FS 00 HST	000D:F0 11	10	BEQ	L3	6-BIT HEXTHI TABLE IS ARRANGED	006A:D0 F7	63	BNE L6	;NO,KEEP LOOKING	
0010013 3C 12 ORA 83C ICAN BE USED DIRECTLY AGE MODIFIER 0011117 645 BPL LB IS IT SECOND BYTE OF A HEADER? 001144 97 FE 13 CON B*72 14 ADD NAT SCO 1001110 NAT	000F:98	11	TYA		SO THAT THE VALUE OF THE DISC BYTE	004C:BD 8C CO	64 L8	LDA \$COBC,X	;POSSIBLY,WHAT'S NEXT?	
0012+49 7E 13 EOR #FF 111 10PERK,Y ADDRESSING BELOW 07/310 66 CP #MA #15 IT ECON DEVICE OF A HEADER? 001a120 06 15 12 BCS 13 IT A SINGLE LOBKUP OPERATION 07/310 36 66 CP BKE 100 FT 100 TPA AAD #*75 100 TPA 460 CP 140 FT FT <t< td=""><td>0010:05 3C</td><td>12</td><td>ORA</td><td>\$3C</td><td>CAN BE USED DIRECTLY AS A MODIFIER</td><td>006F:10 FB</td><td>65</td><td>BPL L8</td><td></td></t<>	0010:05 3C	12	ORA	\$3C	CAN BE USED DIRECTLY AS A MODIFIER	006F:10 FB	65	BPL L8		
0014:29 7E 114 AND **** 110 DETAIL THEX CODE 0073:10 F3 67 BNS L7 INO, TRY ARATH 0016:160 15 L2 INA INA INA 0073:10 F3 67 BNS L7 INO, TRY ARATH 0016:160 16 LS INA INA CONTRID 673:10 F3 67 BNS L7 INO, TRY ARATH 0016:160 10 NR L2 0073:10 F3 67 BNS L7 INT	0012:49 7E	13	EOR	#\$7E	IN 'OPER X' ADDRESSING BELOW	0071:C9 AA	66	CMP #\$AA	;IS IT SECOND BYTE OF A HEADER?	
College of the coll is L2 ESS L3 I IN A SINGLE LODKUP OFERATION OO75: DD 8C EO BE C L0A ECOSt, X Coll is A 16 LSR A 0075: DD 8C EO BE C DO 75: DD 8C EO <	0014:29 7E	14	AND	#\$7E	TO OBTAIN THE EQUIVALENT HEX CODE	0073:D0 F3	67	BNE L7	;NO,TRY AGAIN	
OO18:44 007:10 FB 17 F 67 F 67 F <td>0016:B0 08</td> <td>15 L2</td> <td>BCS</td> <td>L3</td> <td>IN A SINGLE LOOKUP OPERATION</td> <td>0075:BD 8C CO</td> <td>68 L9</td> <td>LDA \$C08C,X</td> <td></td>	0016:B0 08	15 L2	BCS	L3	IN A SINGLE LOOKUP OPERATION	0075:BD 8C CO	68 L9	LDA \$C08C,X		
Oo19:po FB 17 NE L2 OO73:167 %6 70 CHP H4%5 15 IT AN ADDRESS HEADER? OO119:AA 18 TXA OO77:167 08 72 EVC L3 174 KFS OO12:10 21 TNY OU22:10 TXA OU77:167 08 72 EVC L4 174 MER KERSTINN SECTOR EVE 174 MER KERSTINN SECTOR FIND MILITIC SCORE 00021:10 22 EVE L4 HANDLE ASCTOR MER KERDINS SECTOR MER KERDINS SECTOR MANDLE ASCTOR MODES MANDLE ASCTOR MAN	0018:4A	16	LSR	 A		0078:10 FB	69	BPL L9		
OOIE;85 IB TA OUTCR OUTCR SO TA EEG LU0 IVES OOIE;85 CS 19 STA 40356,Y OUTCR SO 195 DR SCOUP SIST OR SECOND PASS THRU THIS CDDE? OOIE;85 CS 17 DEC LA FIND WHICH SLOT DISC CONTROLLER OUTCR SO 17 ECD WAD FARE WE READING SECTOR DATA? OO21:10 CS 22 BPL LI NUT OUTCR SO 100 TA VES NUT OUTCR SO 100 TA NUT OUTCR SO 100 TA NUT OUTCR SO 100 TA NUT TA NUT TA NUT TA NUT NUT TA NUT TA NUT NUT TA NUT TA NUT TA NUT NUT </td <td>0019:D0 FB</td> <td>17</td> <td>BNE</td> <td>L2</td> <td></td> <td>007A:C9 96</td> <td>70</td> <td>CMP #\$96</td> <td>; IS IT AN ADDRESS HEADER?</td>	0019:D0 FB	17	BNE	L2		007A:C9 96	70	CMP #\$96	; IS IT AN ADDRESS HEADER?	
OOIC: 99 56 03 19 174 60356, Y 0007: 58 272 0VC L6 151 OR SECOND PAGS THRU THIS CODE? 0007: 58 20 1NX 0007: 58 20 007: 58 20 1007: 58 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 2007: 68 1000000000000000000000000000000000000	0018:86	18	TYA			007C:F0 08	71	BEQ L10	;YES	
OODE:00 20 TWX OODE:00 20 TWX OODE:00 21 LS INK OODE:00 21 LS INK IARE WER READING SECTOR DATA? 0020:02 21 21 INV INV 002:10 23 25 BVL INV 002:10 23 STR	0010:99 56 03	19	STA	\$0356 V		007E:50 E3	72	BVC L6	;1ST OR SECOND PASS THRU THIS CODE?	
0002:10 G 01 L3 INV 0002:10 G 02 L3 INV 0002:10 G 74 BED L1 INV 0021:10 GZ 22 BF 23 358 IORTS IFIND WHICH SLOT DISC CONTROLLER 0084:40 PD 75 BNE L5 IANO,TAY AGAIN 0022:10 B0 10 25 LDA 4100,X ILOAD A WITH SCN WHERE N=SLOT N VIE 1008:10 FB 77 L1 151 #41 IFREAD IANO ERABLES 100 A SLO 100 A SLO 100 A SLO 100 B DTESA 1000 DTESA 100 DTESA <t< td=""><td>0015.58</td><td>20</td><td>TNY</td><td>40000,1</td><td></td><td>0080:49 AD</td><td>73</td><td>EOR #\$AD</td><td>;ARE WE READING SECTOR DATA?</td></t<>	0015.58	20	TNY	40000,1		0080:49 AD	73	EOR #\$AD	;ARE WE READING SECTOR DATA?	
0000110 C1 C1 C008470 C0097125 C0 C008170 C0087	0020.08	20				0082:F0 26	74	BEQ L14	YES	
002110 023<	0020108	21 L3				0084:D0 DC	75	BNE L5	NO.TRY AGAIN	
0022:00 00 FF 23 036 108 19 1 000 0010 1000 0000000000000000000000	0021:10 ES	22	JCD			0086:A0 FD	76 L10	LDY ##FD	HANDLE A SECTOR ADDRESS	
0022;BA 24 15X 1004 Decomplexe 10	0023:20 38 FF	23	JON	IUKIS	PIND WHICH SECT DISC CONTROLLER	0088:85 41	77 L11	STA \$41	READ IN 6 BYTES, AND COMBINE THEM TO G	
0022180 00 01 25 LDA *100, X 1LDD H WITH 9CN WHERE TO SET V WITH SOMETHING FOR BIT TO SET V WITH 002210A 008418D BC C0 78 L12 LDA \$COBC, X VOLUME, TRACK AND SECTOR OF SECTOR CUR REINTLY 002210A 27 ABL A SOMETHING FOR BIT TO SET V WITH 00210A 00814B BC C0 78 L12 LDA \$COBC, X VOLUME, TRACK AND SECTOR OF SECTOR CUR REINTLY 002210A 27 ABL A SOMETHING FOR BIT TO SET V WITH 00210A 00814B BC C0 78 L12 LDA \$COBC, X VOLUME, TRACK AND SECTOR OF SECTOR CUR REINTLY 002210A 27 ABL A IMANUFACTURE \$NO 0097465 SCC 80 RCL A IEED SCC 900510 FB 900510 FB 900510 FB 9007465 SCC 81 STA SCOBC, X IEED SCC 9007465 SCC 81 STA SCOBC, X IEED SCC 9007465 SCC 81 SCOBC, X IEED SCC 9007465 SCC 81 SCC 83 IEED SCC 9007465 SCC SCC IEED SCC 9007465 SCC IEED SCC 9007465 SCC SCC IEED SCC 9007465 SCC SCC IEED SCC IEED SCC 9007450 SCC SCC	0026:BA	24	15X	++00 V	JUARD ULLUFIES	IVE			···-··	
0022:10A 27 ABL A FRITTURE FOR BIT TO SET V WITH PENTLY FENTLY	0027:BD 00 01	25	LDA	\$100,X	LUAD A WITH DUN WHERE NEGLUT NU	008A: BD 8C CO	78 1 12	IDA \$C08C.X	;VOLUME.TRACK AND SECTOR OF SECTOR CUR	
0022100 /r 28 27 ABL A 008010 FBB 79 BFL L12 ; BEING READ 0022100 /r 29 ABL A 008010 FBB 79 BFL L12 ; BEING READ 0022100 /r 29 ABL A MANUFACTURE \$NO 0090185 30 B1 STA \$30 0031186 2B 32 STX \$28 ; AND PRESERVE FOR FUTURE USE 0097108 B5 HW 0035110 B4 C0 35 BFC 35 BFC 138 BFL L13 FEDUIATION WITH SECTOR 0035110 B4 C0 35 DRA #COBG,X ; SEELECT DRIVE 1, ISNABLE READ 0097128 B5 HW 0035110 B4 C0 35 DRA #COBG,X ; SEELECT DRIVE 1, ISNABLE READ 0097128 B5 HW 0035110 B4 C0 35 DRA #COBG,X ; IATCH, TURM MOTOR N 0097108 B5 HW HO FEDUIATE NO HATCH KEEP TRYING 0035110 B5 GO 37 LDY #B60 ; SEEKING DUTMARDS AT LEART TO FE DISC 00061245 20 B5 HW SITT TA SITT TA SIECH OF 4 PHASES 0~3 OF THE ST	002A:85 2C	26	STA	\$20	SUMETHING FOR BIT TO SET V WITH	RENTLY			······································	
002100A 28 ASL A 008F12A B0 POL A 002E10A 30 ASL A ;MANUFACTURE \$NO 008F12A B0 POL A 002E10A 30 ASL A ;MANUFACTURE \$NO 0097125 B1 STA \$30 0031186 28 32 STX \$228 ;AND PRESERVE FOR FUTURE USE 0097125 GE B4 AND \$30 BL L13 0031186 28 32 STX \$228 ;AND PRESERVE FOR FUTURE USE 0097125 GE B4 AND \$30 BFL L13 0031186 28 COS 34 ECR \$COS4, X SEECTOR FOUND WITH SECTOR \$0097:25 GE B4 AND \$30 ;REQUIRED1F ND MATCH KEEP TRYING 0035:10 B7 CON 85 INV \$0097:25 GE B6 BNE L1 ;DERUIRED1F ND MATCH KEEP TRYING \$0042:45 40 SC \$20074:45 \$30 \$37 EDR \$41 ;DITTD TRACK 0043:129 07 40 SE	002C:0A	27	ASL	A		008D:10 FB	79	<u> Ř</u> PL 112	BEING READ	
002E:0A 29 ABL A 002E:0A 30 ABL A 003E:0A 31 TAX 0090:05 3C 81 GTA \$30 0031:0A 31 TAX ************************************	002D:0A	28	ASL	A		008E:2A	80	BOL A		
0002F10A 30 ASL A i MANUFACIONE \$NO 0092100 EC 00 82 L13 LDA #COBC,X 000301AA 31 TAX AND PRESERVE FOR FUTURE USE 0097125 3C 84 AND #COBC,X 00331:60 28 32 STX \$2B AND PRESERVE FOR FUTURE USE 0097125 3C 84 AND #COBC,X 0033:60 8C 00 34 ECR #COBC,X ISLATCH, TURN MOTOR ON 0097125 3C 84 AND #SC 0035:1D 8C 00 35 DR 4 #COBC,X ISLATCH, TURN MOTOR ON 0097125 3C 84 AND #SC 0035:1D 87 CO 36 DRA \$CO87,X ISLATCH, TURN MOTOR ON 0097125 3D 87 EOR #SC 0035:4D 8C 00 36 DRA \$CO87,X ISLATCH, TURN MOTOR ON 0097125 3D 87 EOR #SC 0035:4D 8C 00 36 DRA \$CO87,X ISEEKING DUTWARDS AT LEAST 40 TRACKS 0006120 42 90 EOR \$400 IREDUTED IN DICATE 2ND PASS THRU C 0041:90 BY TA IFAC INDECALIBRATE THE DISC BY 00042:45 40 90 EOR \$400 INT TO INDICATE 2	002E:0A	29	ASL	A		0090:85 30	81	STA \$30		
00331:A0 31 1AX 31 1AX 31 1AX 00331:B0 22 STX #2B :AND PRESERVE FOR FUTURE USE 0095:10 FB 33 ED EL 13 00331:B0 ECC 33 EOR #COBE,X :SELECT DRIVE 1, ENABLE READ 0097:25 36 AND #3C 0035:10 PD CO 34 EOR #COBE,X :SELECT DRIVE 1, ENABLE READ 0097:25 3C BA AND #3C 0035:10 PD CO 34 EOR #COBE,X :SELECT DRIVE 1, ENABLE READ 0097:25 SC BA AND #SC 0035:10 PD CO 35 DRA #COBE,X :SELECT DRIVE 1, INN MOTOR 0097:10 BC BN L11 :COMPARE SECTOR FOUND WITH SECTOR 0035:10 PD CO 36 DRA #COBE,X :SEEKING DUTWARDS AT LEAST 40 TRACK 0097:10 BC BN L11 :DITTO TRACK 0041:10 BC S7 TA :FECH DF 'IMUST BE TURNED ON THEN DFF, DONE IN 00461:24 2C 92 </td <td>002F:0A</td> <td>30</td> <td>ASL</td> <td>A</td> <td>MANUFALIURE DNU</td> <td>0092:BD 8C CO</td> <td>82 1 13</td> <td>LDA ≸COBC.X</td> <td></td>	002F:0A	30	ASL	A	MANUFALIURE DNU	0092:BD 8C CO	82 1 13	LDA ≸COBC.X		
00331:50 28 32 51x #28 iAND PRESERVE FOR FOUND RE DSE 0097:25 3C 64 AND #3C 00331:50 8E C0 34 EOR #COBE,X istent Transferrer 0097:25 3C 64 AND #3C 00331:50 8E C0 34 EOR #COBE,X istent Transferrer 0097:25 3C 64 AND #3C 00331:50 8E C0 35 EOR #COBE,X istent Transferrer 0097:25 3C 64 AND #3C 00331:50 8E C0 35 EOR #COBE,X istent Transferrer 0097:25 3C 64 AND #3C 00331:50 8E C0 35 EOR #COBE,X istent Transferrer 0097:25 3C 64 AND #3C 00331:50 8E C0 35 EOR #COBE,X istent Transferrer 0097:25 3C 64 AND #3C 0031:50 8E C0 35 EOR #COBE,X istent Transferrer 0097:25 3C 64 AND #3C 0041:05 8C Transferrer AND #SC Interner Interner 0041:45 41 87 EOR #AOD #ADD	0030:AA	31	IAX	+		0095:10 FB	83	BPI 113		
0033:50 BE C0 33 EUK #LOBE,X istellet J DRIVE 1, ENRAGE REHD 0099:08 003 0099:08	0031:86 28	32	SIX	\$2B +0005 V	AND PRESERVE FUR FUIURE USE	0097:25 30	84	AND \$30		
00035120 BC C00 34 EDR #CO8C,X ; CHTCH, TORN HOTOR UN 0007310 BC C00 34 EDR #CO8C,X ; CEMPARE SECTOR FOUND WITH SECTOR 0003710 B7 C0 36 ORA #CO80,X ; RECALIBRATE THE DISC BY 00974:D0 EC BB BNE L11 ; COMPARE SECTOR FOUND WITH SECTOR 0041:10 80 C0 38 L4 ORA #CO80,X ; SEEKING DUTWARDS AT LEAST 40 TRACKS 00974:D0 EC BB BNE L5 0044:96 39 TYA ; SEEKING DUTWARDS AT LEAST 40 TRACKS 0004:00 EC 90 BB BNE L5 0044:96 39 TYA ; SEEKING DUTWARDS AT LEAST 40 TRACKS 0004:00 EC 91 BNE EDR #40 0044:97 39 TYA ; SEEKING DUTWARDS AT LEAST 40 TRACKS 0004:00 EC 92 BIT BNE L11 ; CDMPARE SECTOR POUND WITH SECTOR 0044:96 39 TYA ; SEEKING DUTWARDS AT LEAST 40 TRACKS 00042:24 2C 92 BIT BIT ; DITTO TRACK 0047:05 2B 41 ORA #55 ; DINE IN DESCENDING ORDER THIS SEEKS INMARD. DE DE 0004:14 3C 95 STY #3C ; GET SECTOR DATA 0044:95 0 42 TAX ; THIS COBE IS TIME-CRITICAL 0004:14 3C 95 STY #3C ; GET SECTOR DATA	0033:50 BE CO	33	EUK	\$LUBE,X	SELECT DRIVE I, ENHALE REHD	0099:08	85	INY		
0033:10 BH C0 35 0HA \$COB9,X 0007:10 BH C0 35 0HA \$COB9,X 0007:10 BH C0 35 007 100 H C0 100 H	0036:5D 8C CO	:34	EUR	\$C086,X	ILATCH, TORN MOTOR ON	009A:D0 FC	86	BNE 111	COMPARE SECTOR FOUND WITH SECTOR	
0035110 B3 004 \$C037,40 \$RECALIBRATE THE DISC BY 009110 003110 B0 1004 \$RECALIBRATE THE DISC BY 009110 004110 B0 C037,40 \$RECALIBRATE THE DISC BY 009110 004110 B0 C030110 \$RECALIBRATE THE DISC BY 009110 C2 BE BNE L5 004110 B0 \$RECALIBRATE THE DISC BY 009110 009110 C2 BB BNE L5 004110 B0 \$RECALIBRATE THE DISC BY 0092130 0042140 B0 LDA \$\$41 \$DTTO TRACK 004110 B0 C3 C3 C4 C4 </td <td>0039:10 BA CO</td> <td> </td> <td>URA</td> <td>\$COBA,X</td> <td></td> <td>0090:45 30</td> <td>87</td> <td>EOR \$30</td> <td>REPUTREDIE NO MATCH KEEP TRYING</td>	0039:10 BA CO	 	URA	\$COBA,X		0090:45 30	87	EOR \$30	REPUTREDIE NO MATCH KEEP TRYING	
OODFIND BO 37 LDF ##00 , RECHLIERTIFE THE DIS AT LEAST 40 TRACKS OOD41:1D BO CO 38 L4 DRA #COBO, X ; SEEKING DUTWARDS AT LEAST 40 TRACKS 0042:45 40 90 EDR #40 0041:20 Z 97 40 AND #\$07 ; MUST BE TURNED ON THEN OFF. DONE IN 0042:45 40 90 EDR #40 0047:05 2B 41 DRA #22 ; ASCENDING ORDER THIS SEEKS INWARD. 0046:24 2C 92 BIT #2C ; SET V-BIT TO INDICATE 2ND PASS THRU C 0047:05 2B 41 DRA #22 ; ASCENDING ORDER THIS SEEKS INWARD. 0046:24 2C 92 BIT #2C ; SET V-BIT TO INDICATE 2ND PASS THRU C 0047:04 A 42 TAX ; JONNE IN DESCENDING ORDER THIS SEEKS 0048:70 B7 93 BVS L6 0041:20 BC 43 COR #COB1,X ; THIS CODE IS TIME-CRITICAL 0046:84 3C 95 STY #3C 0041:20 BC 45 JSR #FCA8 ; MONITOR S/R TO WASTE 0081:10 FB 97 BPL L15 ; DATA TO #300-#3355 0053:85 47 DEY ; (26+27*A+5*A*A)/2 MICROSECS 0081:10 FB 97 DEC #32 52 0054:10 EB 48 BPL L4 008	003C:10 87 C0	36		ΨCO87,X	PECALIPRATE THE DICC DV	009E:D0 C2	88	BNE 15	y f Shou har ha f Shou har ak f f Thar f f Shou f f f Shou haa f Th Charles f Shou haa f Th Charles f Shou	
Odd1:1DBC 0035C4DHHFC 00HFC 00HF	003F:H0 80	30 1 /		##80 #COBO V	PREVALIDRATE THE DIDU DY	0040:45 41	89	1 DA \$41	:DITTO TRACK	
OOAT: 7637174, EECH OF 4 PHABES 0 3 OP THE STEPPEOOA: 1070EER 40OOA: 10070AND#\$07; MUST BE TURNED ON THEN OFF. DONE IN (ACTOR 0 42OOA: 1000A: 2091BIT52C; SET V-BIT TO INDICATE 2ND PASS THRU COO47:05 2B41ORA\$2B; ASCENDING ORDER THIS SEEKS INWARD. ; DONE IN DESCENDING ORDER THIS SEEKS INWARD.OOAA: 2092BIT\$2C; SET V-BIT TO INDICATE 2ND PASS THRU CO047:05 2B41ORA\$2DTAX; DDNE IN DESCENDING ORDER THIS SEEKS INWARD.OOAA: 405694L14LDY#\$56; GET SECTOR DATAO040:3D81 C043EOR\$CO81,X; THIS CODE IS TIME-CRITICALOOAA: 405694L14LDY#\$56; GET SECTOR DATAO047:20A8 <fc< td="">45JSR\$FCA8; MONITOR \$/R TO WASTEOOAA: 805694L14LDY#\$56; GET SECTOR DATAO047:20A8<fc< td="">45JSR\$FCA8; MONITOR \$/R TO WASTEOOAA: 805094L15; DATA TO \$300-\$355O053:8847DEY; (26+27*A+5*A*A)/2 MICROSECSOOB8:443C100LDY\$3CO054:10EB48BPLL4OOB894E1500B8:443C100LDY\$3CO054:10EB48BPLL4OOB800B8:443C100LDY\$3C505050505050LDA\$450850</fc<></fc<>	0041:10 80 00	30 L4 70		⊅CUOU ,∧	SEENING DUTWHRDS HT LEHST 40 TRHCKS	0042:45 40	90	EOR \$40		
Normal OO45:29 0740AND#\$07;MUST BE TURNED ON THEN OFF. DONE IN SCENDING ORDER THIS SEEKS INWARD. ;DDNE IN DESCENDING ORDER THIS SEEKS INWARD. ;DDNE IN DESCENDING ORDER THIS SEEKS INWARD. ;DDNE IN DESCENDING ORDER THIS SEEKS (OUTWARD0046:24 2C92BIT\$2C;SET V-BIT TO INDICATE 2ND PASS THRU C0047:05 2B410RA\$2B;ASCENDING ORDER THIS SEEKS INWARD. ;DDNE IN DESCENDING ORDER THIS SEEKS (OUTWARD0046:24 2C92BIT\$2C;SET V-BIT TO INDICATE 2ND PASS THRU C0047:05 2B42TAX;DDNE IN DESCENDING ORDER THIS SEEKS (OUTWARD;0A6:24 2C93BVSL60048:70 B993BVSL60048:50 81 CO43EOR\$CO81,X;THIS CODE IS TIME-CRITICAL00A6:24 3C95STY\$3C0047:20 A8 FC44LDA#\$56;MONITOR S/R TO WASTE00A6:26 3C95STY\$3C0052:8847DEY;(26+27*A+5*A*A)/2 MICROSECS00B1:10 FB97BE CIR\$02D6,Y0055:85 3D49STA\$3D008:44 3C100LDY\$3C0052:85 2751STA\$27STA\$27STA\$27STA\$270054:85 2751STA\$27STA\$27STA\$20\$110STA\$104BPLL16\$TO ADDRESS AREA POINTED TO BY (\$26,\$27)	MOTOR	57	ITH		, CHUR OF 4 FRHBES 0-3 OF THE STEFFE	0044:D0 BC	91	BNE 15		
OOd 7: 052B41ORA \$2B; ASCENDING ORDER THIS SEEKS INWARD.ODEOOd 7: 052B41ORA \$2B; ASCENDING ORDER THIS SEEKS INWARD.ODEOOd 7: 052B42TAX; DONE IN DESCENDING ORDER THIS SEEKS INWARD.ODEOUTWARD0047: 0544LDA #\$5600A6: 045694L14LDY #\$56; GET SECTOR DATAOO49: A95644LDA #\$5600A6: 045694L14LDY #\$08C,X; READ IN 85 BYTES OF SECONDARYO042: A95644LDA #\$5600A6: 843C95STY \$3CO042: A95644LDA #\$5600A110 R S/R TO WASTE00B1: 10 FB97BFLL15; DATA TO \$300-\$355O052: 8846DEY; (26+27*A+5*A*A)/2 MICROSECS00B3: 59D6 0298EOR \$02D6,Y90B6: C6 3C99DEC\$3CO054: 85< 3D	0045.29 07	40	AND	##07		0004*24 20	00	BIT 420	SET V-BIT TO INDICATE 2ND PASS THRU C	
0049:103 10 11 010 11 010 11 010 11 010 11 010 11 010 11 010 11 010 11 010 11 010 11 010 11 010 11 11 010 11 11 010 11 11 010 11 11 11 11 11 010 11	0047:05 28	40		##07 #70	ACCENDING ORDER THIS SEEVE INHADD	ODE	, 	deal de la ren des had		
004:50 94 114 115 115 115 114 107 ##\$56 ; GET SECTOR DATA 004A:50 81 00 43 EOR \$CO81,X ; THIS CODE IS TIME-CRITICAL 00AA:60 56 94 114 LDY #\$56 ; GET SECTOR DATA 0044:50 81 CO 44 LDA #\$56 00A:80 56 94 114 LDY #\$56 ; GET SECTOR DATA 0041:47 56 44 LDA #\$56 ; MONITOR S/R TO WASTE 00A:80 56 94 L14 LDY #\$000-#\$355 0052:88 46 DEY ; (26+27*A+5*A*A)/2 MICROSECS 00B1:10 FB 97 BPL L15 ; DATA TO \$300-#\$355 0053:88 47 DEY ; (26+27*A+5*A*A)/2 MICROSECS 00B6:C6 50 99 DEC \$300 0054:10 EB 48 BPL L4 008:A4 30 104 STA \$300,Y 0054:85 3D 49 STA \$3D 008:00 EF 102 BNE L15 <t< td=""><td>0049.00</td><td>47</td><td></td><td>¥2D</td><td>DONE IN DESCENDING ODDED THIS SEEKS</td><td>0048.70 89</td><td>97</td><td>6VS 14</td><td></td></t<>	0049.00	47		¥2D	DONE IN DESCENDING ODDED THIS SEEKS	0048.70 89	97	6VS 14		
004A:5D 81 C0 43 EDR \$COB1,X ;THIS CODE IS TIME-CRITICAL 00AC:80 3C 95 STY \$3C 0044:5D 81 C0 44 LDA #\$56 004A:5D 81 C0 96 LDA #\$3C 0042:20 AB FC 45 JSR \$FCAB ;MONITOR S/R TO WASTE 00AC:80 3C 95 DEV \$JATA TO \$300-\$355 0052:88 46 DEY ; (26+27*A+5*A*A)/2 MICROSECS 00B1:10 FB 97 BFL L15 ;DATA TO \$300-\$355 0053:88 47 DEY ; (26+27*A+5*A*A)/2 MICROSECS 00B2:50 D6 02 98 EOR \$02D6,Y 0054:10 EB 48 BPL L4 00B2:50 D6 02 97 DEC \$3C 0054:85 3D 47 DEY 00B2:00 CF 100 LDY \$300,Y 0058:A9 08 50 LDA #\$08 00B1:00 FF 102 BNE L15 0054:85 27 51 STA \$27 STA \$27 00B1:00 FB 104 BPL L16 ;TO ADDRESS AREA POINTED TO BY (\$26,\$2		72	1 11 1		DONE IN DESCENDING ORDER THIS SEEK,	0000.00 54	94 1 14	1.11 × #\$56	SET SECTOR DATA	
0041:39 56 44 LDA #\$56 0042:30 A8 FC 45 JSR \$FCAB ;MONITOR S/R TO WASTE 00AE:BC 8C CO 96 L15 LDA ;DATA TO \$300-\$355 0045:20 A8 FC 45 JSR \$FCAB ;MONITOR S/R TO WASTE 00B1:10 FB 97 BPL L15 ;DATA TO \$300-\$355 0052:88 46 DEY ; (26+27*A+5*A*A)/2 MICROSECS 00B3:59 D6 02 98 EOR \$02D6,Y 0053:88 47 DEY ; (26+27*A+5*A*A)/2 MICROSECS 00B3:59 D6 02 98 EOR \$02D6,Y 0054:10 EB 48 BPL L4 00B8:A4 3C 100 LDY \$3C 0054:85 3D 47 STA \$3D 00BA:97 00 3 101 STA \$300,Y 0058:A9 08 50 LDA #\$08 00B1:D0 EF 102 BNE L15 0057:85 27 51 STA \$27 STA \$27 00B1:D0 EF 104 LDY \$C08C,X ;READ IN 256 BYTES OF PRIMARY DATA 0052:10 FB 104 BPL L16 ;TO A	0044.50 81 00	43	COD	#0001 V	THIC CODE IS TIME CONTICAL	00AC:94 3C	05	QTV 430		
004F:20 AB FC 45 JSR \$FCAB ;MONITOR S/R TO WASTE 00B1:10 FB 97 BPL L15 ;DATA TO \$300-\$355 0052:88 46 DEY ;(26+27*A+5*A*A)/2 MICROSECS 00B1:10 FB 97 BPL L15 ;DATA TO \$300-\$355 0053:88 47 DEY ;(26+27*A+5*A*A)/2 MICROSECS 00B1:10 FB 97 DEC \$0020,Y 0054:10 EB 48 BPL L4 00B8:A4 3C 100 LDY \$3C 0054:85 3D 49 STA \$3D 00BA:99 00 03 101 STA \$300,Y 0058:A9 08 50 LDA #\$08 00B1:D0 EF 102 BNE L15 0054:85 27 STA \$27 STA \$27 00B1:0 FB 104 BPL L16 ;TO ADDRESS AREA PDINTED TO BY (\$26,\$2 0054:85 27 51 STA \$27 00B1:00 FF 104 BPL L16 ;TO ADDRESS AREA PDINTED TO BY (\$26,\$2	004D-09 54	40		#0001;A	THIS CODE IS TIME-CRITICHE	00AE.BC OC CO	04 115	UNV \$COBC ¥	READ IN 85 BYTES OF SECONDARY	
0051:10 P3 038 \$FCHB ;MUNITUR 3/R TO WHSTE 0051:10 P5 77 ETC 133 ;ETT 134 5000 1000 1000 1000 0052:88 46 DEY ; (26+27*A+5*A*A)/2 MICROSECS 0083:59 D6 02 98 ETC \$00206,Y 0053:88 47 DEY 0084:20 0083:59 D6 02 98 ETC \$00206,Y 0054:10 EB 48 BPL L4 0088:A4 100 LDY \$300,Y 0056:65 3D 49 STA \$3D 008A:99 00 3101 STA \$300,Y 0053:89 06 DD EF 102 ENE L15 0054:85 27 S1 STA \$27 008F:8C 8C C0 103 L16 LDY \$C08C,X ;READ IN 256 BYTES OF PRIMARY DATA 0054:85 27 S1 STA \$27 008F:8C 8C C0 103 L16 ;TO ADDRESS AREA PDINTED TO BY (\$26,\$2 002:10 FB 104 BPL L16 ;TO ADDRESS AREA PDINTED TO BY (\$26,\$2	004E.20 A8 EC	45	TCD	##J0 ##J0	MONITOR CO TO MARTE	00P1.10 EP	70 LIJ 07	DDI 115	"NATA TA \$300-\$355	
0053:88 47 DET ,(25+2/*H+3/*H+3/*/12 M1CR0SECS 0053:37 DB 02 78 EDR #02D3,1 0053:88 47 DEY 0086:26 3C 99 DEC #3C 0054:10 EB 48 BPL L4 0088:34 3C 100 LDY #3C 0055:87 08 50 LDA #\$08 0088:44 3C 100 LDY #3C 0055:87 08 50 LDA #\$08 0081:97 00 03 101 STA \$300,Y 0058:87 08 50 LDA #\$08 0081:00 EF 102 BNE L15 0053:85 27 51 STA \$27 008F:8C 8C C0 103 L16 LDY \$C08C,X ;READ IN 256 BYTES OF PRIMARY DATA 0053:85 27 51 STA \$27 0025:10 FB 104 BPL L16 ;TO ADDRESS AREA POINTED TO BY (\$26,\$2	0052:88	44		+1 UHO	: (2412780158080)/0 MICDOCCCC '	0083,50 NL 00		ENE \$0204 V	y and a set of the set of the set of the back had	
0054:10 EB 48 BPL L4 0058:A4 100 LDY \$3C 0054:10 EB 49 STA \$3D 00B1:00 ED \$3C 0056:65 3D 49 STA \$3D 00B1:00 EF 100 LDY \$3C 0058:A4 00 00B1:00 EF 102 ENE L15 0054:85 27 51 STA \$27 00BF:8C 8C 104 ENE L15 0054:85 27 51 STA \$27 00BF:8C 8C 104 ENE L16 ITO ADDRESS AREA POINTED TO BY (\$26,\$2 0054:85 27 51 STA \$27 51 STA \$27 51 ITO ADDRESS AREA POINTED TO BY (\$26,\$2 0052:10 FB 104 BPL L16 ;TO ADDRESS AREA POINTED TO BY (\$26,\$2 7) 7 7 7 7 50 7 7 7 <	0053:88	47	DEV		, LOIZ/ MTJAHAH//2 MILKUBELB	0084.04 30 02	20	DEC 430		
0056:85 3D 49 STA \$30 90 008:97 00 03 101 STA \$300,Y 0056:85 3D 60 LDA #\$08 008:97 00 03 101 STA \$300,Y 0058:47 08 50 LDA #\$08 008:00 EF 102 ENE L15 0054:85 27 51 STA \$27 008:86 8C CO 103 L16 LDY \$C08C,X ;READ IN 256 BYTES OF PRIMARY DATA 0054:85 27 51 STA \$27 002:10 FB 104 BPL L16 ;TD ADDRESS AREA POINTED TO BY (\$26,\$2 007 7) 7 7 7 7 7 7	0054.10 FP	49	ושמ	1.4		0080.00 JL 0080.00 JC	100	ULU \$00 UNV \$70	:	
0058:00 97 514 \$300,1 0058:47 08 50 514 \$300,1 0058:47 08 00 514 \$300,1 0058:47 08 50 EF 102 ENE 0053:85 27 51 STA \$27 00 00 EF 102 EF 102 ENE L15 0054:85 27 51 STA \$27 00 00 EF 104 LDY \$C08C,X \$READ IN 256 BYTES OF PRIMARY DATA 0054:85 27 51 STA \$27 00 00 EF 104 BPL L16 ;TO ADDRESS AREA POINTED TO BY (\$26,\$2 7) 7 7 7 7 100 104 <t< td=""><td>0054:85 30</td><td>49</td><td>OFL CTA</td><td>L-+ # 7 D</td><td></td><td>008A.00 00 07</td><td>100</td><td>CTA \$300 V</td><td></td></t<>	0054:85 30	49	OFL CTA	L-+ # 7 D		008A.00 00 07	100	CTA \$300 V		
COULTRY OF COULTRY OF <thcoultry of<="" th=""> COULTRY OF COULTRY</thcoultry>	0058.49 00	50		#3D #¢∩Q		0080.00 CC	102	DIN \$300,1		
OUDRIGG 2/ SI <td>0054.85 27</td> <td>51</td> <td>CTA</td> <td>π≇∪0 ¢07</td> <td></td> <td>OODE.DC CC CC</td> <td>102 144</td> <td>LINY &CORC Y</td> <td>READ IN 254 BYTES OF PRIMARY DATA</td>	0054.85 27	51	CTA	π≇∪0 ¢07		OODE.DC CC CC	102 144	LINY &CORC Y	READ IN 254 BYTES OF PRIMARY DATA	
$\frac{3002210 FB}{7}$	oourniuu 27	1	DIN	₽∠/		0002.10 ED	103 116	EDI 114	TO ADDRESS AREA POINTED TO BV (474 47	
						7)	104	And the the A Co	y e une resources sonn butbat i terstonn it e suiskeitit bann door e suis doo'i . Sternada butgite dan.	

00C4:59 D6 0 00C7:A4 3C)2 105 106	EOR LDY	\$02D6,Y \$3C		
0009:91 26	107	STA	(\$26),Y		
00CB:C8	108	INY			
00CC:84 3C	109	STY	\$3C		
OOCE:DO EF	110	BNE	L16		
OODO:BC 8C C	0 111	L17 LDY	\$C08C,X		
00D3:10 FB	112	BPL	L17		
00D5:59 D6 0	2 113	EOR	\$02D6,Y	;VERIFY DATA SUMCH	ECK VALID
00D8:D0 88	114	L18 BNE	L5		
OODA:A8	115	TAY			
00DB:A2 56	116	L19 LDX	#\$56		
OODD:CA	117	L20 DEX			
OODE:30 FB	118	BMI	L19		
00E0:B1 26	119	LDA	(\$26),Y		
00E2:5E 00 0	3 120	LSR	\$0300,X	;NIBBILISE PRIMARY	AND SECONDARY
00E5:2A	121	ROL	A	;DATA TOGETHER	
00E6:5E 00 0	3 122	LSR	\$03 0 0,X		
00E9:2A	123	ROL	A		
00EA:91 26	124	STA	(\$26),Y		
00EC:E6 26	125	INC	\$26		
OOEE:DO ED	126	BNE	L20		
00F0:E6 27	127	INC	\$27		
00F2:E6 3D	128	INC	\$3D		
00F4:A5 3D	129	LDA	\$3D		
00F6:CD 00 0	8 130	CMP	\$0800	;ARE MORE SECTORS	TO BE READ?
00F9:A6 2B	131	LDX	\$2B	;ONLY IF BOOTING F	ROM A 'BASICS' DISKE
TTE					
OOFB:90 DB	132	BCC	L18		
00FD:4C 01 0	8 133	JMP	\$0801	START TO EXECUTE S	SECOND STAGE BOOTSTR
AP					
*** SUCCESSFI	UL ASSEM	BLY: NO ERR	JRS		
		06.1.1		86 L10	88 L11
PF38 10K)5		92 1 13		AA L14	AE L15
0M L12		DO 117		D8 L18	DB L19
14 L 7		DD 120		20 L3	41 L4
		63 1 6		68 L7	6C LB
7510					
/3 2/					
06 L1		16 L2		20 L3	41 L4
62 L5		63 L6		68 L7	6C LB
75 L9		86 L10		88 L11	8A L12
92 L13		AA L14		AE L15	BF L16
DO L17		D8 L18		DB L19	DD L20
FF58 IORTS					

.

Appendix 2 - Circuit Diagram

.

,

.

,

.

an o can in an o c

U-MICROCOMPUTERS

U-Microcomputers Ltd. Winstanley Industrial Estate, Long Lane, Warrington, Cheshire WA2 8PR Telephone 0925-54117/8 Telex 629279 UMICRO G

/ 1988 3 [1988 /// 1988 3 [1988 /// 1989 3 [1988 3 // 1989 3 [1988 3 [1988 3 [1988 3 [1988 3 [1988 3 // 1989 3 [1988 3 [