
DESCRIPTION: ZETACO SMD DISK CONTROLLER DIAGNOSTIC

Product of ZETACO, 1985

TITLE DISKD
.DUSR X=1
.NOMAC X

1.0 PROGRAM NAME: DISKD.SR

2.0 REVISION HISTORY:

REV.	DATE	
00	02/17/83	
01	09/07/83	; ANOTHER RDY UNIT WARNING, 1 HD ERR C22, ; AOS BOOTSTRAP(400'S), NO OFFSET TESTS ; FOR CMD'S
02	03/28/84	; 295C, 296 AND BMX TESTS ; DEVICE CODE CHANGE ROUTINE
03	06/12/84	; ZDF1 CHANGES, A5 TESTS 17-76
04	08/21/85	; DISABLE VIRTUAL, WEL-RECAL, DISK SIM PARMS

3.0 MACHINE REQUIREMENTS:

NOVA OR ECLIPSE FAMILY CENTRAL PROCESSOR
MINIMUM OF 16K READ/WRITE MEMORY
ZETACO SMD DISK CONTROLLER
0-3 DISK DRIVES
TELETYPE OR CRT AND CONTROL

4.0 TEST REQUIREMENTS: N/A

5.0 SUMMARY:

THIS PROGRAM IS A HARDWARE DIAGNOSTIC FOR THE
ZETACO SMD DISK CONTROLLER AND DRIVES.
THE DEVICE CODE MAY BE 20-76 OCTAL WITH THE
DEFAULT BEING 27

6.0 RESTRICTIONS:

THIS PROGRAM HAS NO RESTRICTIONS AS TO SINGLE OR
DUAL PROCESSOR HARDWARE CONFIGURATION. HOWEVER, THE
DIAGNOSTIC MAY BE RUN ON ONLY ONE CPU AT A TIME AND
MUST BE THE ONLY PROGRAM BEING RUN WITHIN THE DISK
SYSTEM.

7.0 PROGRAM DESCRIPTION/THEORY OF OPERATION:

7.1 "A" TESTS CHECK:

- BUSY, DONE, I/O BUS SELECT LOGIC
- DISK SELECT LOGIC, CONTROLLER RAM

7.2 "B" TESTS CHECK:

- START, BUSY, CLEAR LOGIC
- RECALIBRATE, ATTN, INTERRUPT LOGIC

- ; - INTERRUPT DISABLE, INTA LOGIC
- ; - THAT SEEKS TO CYL'S 0, 1/2 CYL MAX, AND CYL MAX CAN AT
- ; LEAST BE EXECUTED AND SET DRIVE BUSY.
- ; - READY/SELECT LOGIC

; 7.3 "C" TESTS CHECK:

- ; - THAT THE CA REGISTER INCREMENTS PROPERLY
- ; VIA DCH OR BMC REQUESTS
- ; - THAT A WRITE CAN BE EXECUTED
- ; - SELD, CLEAR LOGIC
- ; - THAT SEEK/WRITE OPERATIONS CAN BE EXECUTED
- ; - WRITES TO DIFFERENT HDS, SECTORS
- ; - MULTI-SECTOR WRITES
- ; - THE INCREMENT HEAD LOGIC
- ; - ILLEGAL SECTOR, SURFACE, CYLINDER CONDITIONS

; 7.4 "E" TESTS CHECK:

- ; - THAT A READ MAY BE EXECUTED
- ; - 8 SECTOR WRITE/READ OPERATIONS (9 DIFFERENT
- ; DATA PATTERNS) AT CYL'S 0, 1/2 CYL MAX AND CYL MAX WITH FULL
- ; CORE COMPARE
- ; - DATA VERIFY FUNCTION (NORMAL AND WITH FORCED ERRORS)
- ; - OFFSET MODES
- ; - ILLEGAL COMMAND TRAPS
- ; - WRITE CYL# TO HEAD 0, SECTOR 0 OF ALL CYLINDERS
- ; - WRITE HEAD # TO SECTOR 0 OF ALL HEADS ON CYL 0
- ; - WRITE SECTOR # TO ALL SECTORS OF HEAD 0, CYL 0
- ; - EACH OF THE ABOVE OPERATIONS IS FOLLOWED
- ; BY A CORRESPONDING READ/CHECK OPERATION TO VERIFY
- ; DISK ADDRESSING LOGIC.

; 7.5 "F" TESTS CHECK:

; THE FORMAT LOGIC ON CYL 0, HEAD 0, SECTOR 0,
 ; A BAD SET FLAG IS SET AND TESTED
 ; THE FORMAT IS SET TO NORMAL AFTER COMPLETION OF
 ; THESE TESTS.
 ; ## SEE SWPAK 7 OPTION ##

; 7.6 "S" TESTS ARE SEEK EXERCISERS

- ; - PERFORMS RANDOM SEEKING. EACH SEEK IS FOLLOWED BY A
- ; READ TO HEAD 0, SECTOR 0
- ; - PERFORMS RANDOM OVERLAPPED SEEKING TO TWO DRIVES.
- ; EACH SEEK IS FOLLOWED BY A READ TO HEAD 0, SECTOR 0.
- ; U1 IS THE THE PRIMARY UNIT UNDER TEST AND U2
- ; IS THE NEXT DRIVE FOUND IN A 1, 2, 3, 0 ETC. SEARCH.
- ; IF ONLY 1 DRIVE, TEST IS BYPASSED. TEST IS ONLY RUN
- ; AFTER A PASS IS ACHIEVED ON ALL DRIVES:

; 8.0 OPERATING MODES/SWITCH SETTINGS:

; 8.1 SWITCH SETTINGS

; LOCATION "SWREG" IS USED TO SELECT THE PROGRAM OPTIONS
 ; THIS LOCATION WILL BE SET ACCORDING TO THE ANSWERS
 ; SUPPLIED BY THE OPERATOR; THE OPTIONS CAN BE CHANGED
 ; OR VERIFIED BY USING ONE OF THE COMMANDS GIVEN IN SEC.
 ; 8.3

; 8.2

SWITCH OPTIONS
DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION
"SWREG" IS AS FOLLOWS:

BIT	OCTAL VALUE	BINARY VALUE	INTERPRETATION
1	40000	0 1	LOOP ON ERROR SKIP LOOPING ON ERROR
2	20000	0 1	PRINT TO CONSOLE ABORT PRINT OUT TO CONSOLE
3	10000	0 1	DO NOT PRINT % FAILURE PRINT % FAILURE
5	02000	0 1	DO NOT PRINT ON THE LINE PRINTER PRINT ON THE LINE PRINTER
6	01000	0 1	DO NOT HALT ON ERROR HALT ON ERROR
7	00400	0 1	N/A DISABLE FORMATTING HEAD 0, CYLINDER 0, SECTOR 0 ##SEE 12.2##.
8	00200	0 1	N/A RECALIBRATE DURING SCOPE LOOP
9	00100	0 1	N/A 1 SECOND DELAY DURING SCOPE LOOP
10(A)	00040	0 1	N/A PROGRAM WILL PRINT TEST #'S AND FIRMWARE REVISIO
11(B)	00020	0 1	N/A PROGRAM WILL EXIT TO ODT WHEN NOT IN TESTS F1- ##SEE 7.5## SWITCH IS SET TO 0 UPON EXIT
12(C)	00010	0 1	SKIP LONG RAM TEST LONG CONTROLLER RAM TEST

; 8.3

SWITCH COMMANDS
ONCE THE PROGRAM STARTS EXECUTING THE STATE OF ANY OF
THE BITS CAN BE CHANGED BY HITTING KEYS 1-9, A-F. THE
PROGRAM WILL CONTINUE RUNNING AFTER UPDATING THE OPTIONS.
EACH KEY WILL COMPLEMENT THE STATE OF THE BIT AFFILIAT-
ED WITH IT, THUS BIT 4 CAN BE ALTERED BY HITTING KEY 4.
SETTING OF ANY BIT OF LOCATION "SWREG" WILL SET BIT 0.
(DEFAULT MODE IS DEFINED AS ALL BITS OF SWREG SET TO 0)

; 8.4

OTHER COMMANDS (° = CONTROL KEY)

"CR" A "RETURN" CAN BE TYPED TO CONTINUE THE PROGRAM
AFTER ITS LOCKED IN A SWITCH MODIFICATION MODE

°D THIS COMMAND GIVEN AT ANY TIME WILL RESET "SWREG"
TO DEFAULT MODE AND RESTART THE PROGRAM.

°R THIS COMMAND GIVEN AT ANY TIME WILL RESTART THE
PROGRAM. SWITCHES ARE LEFT WITH THE VALUES THEY
HAD BEFORE THE COMMAND WAS ISSUED.

°O THIS COMMAND GIVEN AT ANY TIME WILL CAUSE THE

PROGRAM CONTROL TO GO TO ODT (NOTE: THIS IS AN
OPTIONAL COMMAND AND IS AVAILABLE ONLY IF
ODTPK IS PRESENT)

M THIS COMMAND GIVEN AT ANY TIME WILL PRINT THE
CURRENT OPERATING MODES.

O THIS COMMAND GIVEN AT ANY TIME WILL LOCK THE
PROGRAM INTO SWITCH MODIFICATION MODE WHERE
MORE THAN 1 BIT CAN BE CHANGED.

9.0 OPERATING PROCEDURE/OPERATOR INPUT:

9.1 LOAD USING THE BINARY LOADER

9.2 STARTING ADDRESSES

200-TO IDENTIFY DISK TYPE (INITIALIZE)
PROGRAM THEN PROCEEDS TO 500.

201-ODT DIRECT ENTRY ONLY

202-RANDOM SEEK EXERCISERS. (1 PASS OF DIAG FOR EACH UNIT FIRST)
SEEK EXER 1 IS A SINGLE DRIVE EXERCISER

SEEK EXER 2 IS TWO DRIVE EXERCISER WITH SEEK OVERLAP
500-DIAGNOSTIC (RESTART)

9.3 THE PROGRAM PRINTS "PASS" FOLLOWING EACH
COMPLETE PASS THROUGH THE TESTS. RANDOM
SEEK EXERCISER PERFORMS 1000 SEEKS
PER "PASS" MESSAGE.

9.4 DEVICE CODE OF CONTROLLER IS REQUESTED (27 IS DEFAULT)

9.5 UNIT NUMBERS TO BE TESTED ARE REQUESTED TO WHICH THE OPERATOR
ENTERS THE UNIT NUMBERS TO BE TESTED, SEPARATING
THE INDIVIDUAL #'S BY A <,> OR <SPACE>.

9.6 OPERATOR IS REQUESTED TO ENTER 1, IF UNIT CHARACTERISTICS
DISPLAYED ARE INCORRECT, AND WANTS TO LOOP ON READING THEM

10. PROGRAM OUTPUT/ERROR DESCRIPTION:

WHEN AN ERROR IS DETECTED THE PROGRAM PRINTS THE ERROR
PC, AC'S 0,1, AND 2 AT THE POINT OF ERROR, THE PROGRAM THEN
GOES INTO A SCOPE LOOP BETWEEN THE ENTRIES TO
.SETUP AND .LOOP ALLOWING THE OPERATOR TO SET SWPAK.
IN GENERAL THE ERROR PC WILL POINT TO A CALL ERROR.

THE PRINTOUT WILL BE OF ONE OF THE FOLLOWING FORMATS:

A. STANDALONE CONTROLLER TEST FAILURES-

B. STATUS ERRORS

MODE	UNIT	#	DATA
CYL	#	HEAD	# SECTOR #

AC1(STATUS) SHOULD =AC0
DESCRIPTIONS OF FAILING STATUS BITS

C. MEMORY/DISK ADDRESS ERROR

MODE	UNIT	#	DATA
CYL	#	HEAD	# SECTOR #

ENDING MEMORY/DISK ADDRESS ERROR
AC1(MA/DA) SHOULD =AC0

; C. INTERRUPT TIMEOUT

; MODE UNIT # DATA
; CYL # HEAD # SECTOR #
; INTERRUPT TIMEOUT

; ADDITIONAL TEST SIGNIFICANCE CAN BE FOUND IN THE PROGRAM
; LISTING, ALTHOUGH IT IS HOPED THAT A NEED FOR THE
; LISTING WILL BE MINIMAL. SWPACK(SWREG) WILL PROVIDE
; ALL CONTROL OVER TEST LOOP OPTIONS AND PRINTOUTS.

; DATA ERRORS WILL RESULT IN THE 1ST 3 GOOD/BAD
; PAIRS AND THEIR ADDRESSES BEING PRINTED ALONG WITH THE
; TOTAL COUNT. IF AN ECC ERROR IS DETECTED, THE CALL
; EHECC WILL ACKNOWLEDGE THE FACT AND RETURN TO THE
; MAIN TEST FOR THE DATA COMPARE; PRINTOUTS RESULT
; ON THE 1ST ERROR PASS ONLY. AS THE CHECK ROUTINE
; CHECKS THE ENTIRE READ BUFFER, ANY ERROR ACCOMPANIED
; BY AN ECC ERROR, TERMINATING THE READ, MAY CAUSE ALL
; DATA IN SUCCEEDING SECTORS TO APPEAR BAD.

; TESTS THAT PERFORM A RECALIBRATE HAVE A 2 SEC.
; DELAY BUILT INTO THE SCOPE LOOP. SET SWPAK 9 = 1
; TO INTRODUCE AN ADDITIONAL 1 SECOND DELAY DURING
; THE SCOPE LOOP.

; IN GENERAL EACH SUCCESSIVE TEST ASSUMES ALL
; PREVIOUS TESTS WORK. BYPASSING ERRORS
; CAN RESULT IN CONFUSING SITUATIONS
; IN THE SETUP OF MORE COMPLEX TESTS.

; 11. DEBUG HELP:
; 0?DTD 11B

; 12. SPECIAL NOTES/SPECIAL FEATURES:

; 12.1 IF THE DISK PACK HAS BAD SECTOR FLAGS SET ON CYLINDER
; 0, OR ON THE FIRST 8 SECTORS OF HEAD 0 OF ANY CYLINDER,
; ERROR PRINTOUTS WILL RESULT WHEN THE FLAGS ARE
; ENCOUNTERED.

; 12.2 TESTS F1-F3 ALTER THE FORMAT ON
; CYL 0, HD 0, SEC 0 FOR PURPOSES OF
; CHECKING THE FORMAT LOGIC AND BAD SECTOR LOGIC.
; SWPAK7 SHOULD BE SET TO 1 IN ORDER TO STOP PROGRAM
; FROM EXECUTING THE FORMAT.

; 12.3 SOME SCOPE LOOPS WILL REQUIRE A RECALIBRATE
; TO INITIALIZE THE DISK DRIVE FOLLOWING A FAILURE.
; SET SWPAK 8 = 1 TO INTRODUCE THE RECALIBRATE TO THE
; UNIT UNDER TEST.

; 12.4 DISK PACKS
; ONLY USE DISK PACKS FORMATTED BY THE DISKF
; PACK FORMATTER PROGRAM. THE DIAGNOSTIC PROGRAM
; WILL WRITE OVER MOST OF THE DISK SURFACE.

; 13. RUN TIME:
; THE RUN TIME FOR A PASS IS APPROXIMATELY: 3 MIN.

DESCRIPTION: ZETACO SMD DISK CONTROLLER FORMATTER PROGRAM

Product of ZETACO, 1985

TITLE DISKF

.DUSR X=1

.NOMAC X

1.0 PROGRAM NAME: DISKF.SR

2.0 REVISION HISTORY:

REV.	DATE	
00	02/09/83	
01	08/23/83	; ADUB FOR ALT1 (STTD), AOS BSTRAP (400'S)
02	03/28/84	; DISK PULSE COUNTER, ERROR LOGS, 200. ; ERRORS, MSB FOR BAD SECTOR LOG ; DEVICE CODE CHANGE ROUTINE ; ECC ON WRITE, ZDF1
03	05/30/84	
04	08/21/85	; DISABLE VIRTUAL, UP TO 2048. CYLS

3.0 MACHINE REQUIREMENTS:

NOVA/ECLIPSE FAMILY CENTRAL PROCESSOR
16K READ/WRITE MEMORY
TELETYPE OR CRT DISPLAY
ZETACO SMD DISK CONTROLLER
0-3 DISK DRIVES

4.0 TEST REQUIREMENTS: N/A

5.0 SUMMARY:

THE ZETACO SMD DISK CONTROLLER FORMATTER PROGRAM IS A PROGRAM DESIGNED TO FORMAT AND CHECK DISK PACKS TO BE USED ON DISK SYSTEMS. THE PROGRAM IS NOT A MAINTENANCE PROGRAM AND ASSUMES THE HARDWARE TO BE IN WORKING ORDER. THE PROGRAM WILL HALT ON ANY NON-DATA RELATED ERRORS. ALTHOUGH PRESSING CONTINUE WILL ALLOW THE PROGRAM TO PROCEED, IT IS NOT RECOMMENDED THAT THE PROGRAM BE RUN UNDER THESE CONDITIONS. IT IS ALSO RECOMMENDED THAT ON-BOARD ECC BE SOFTWARE OR CONFIGURED DISABLED WHEN FORMATTING.

THE CONTROL CAN BE ANY DEVICE 20-76 OCTAL
THE DEFAULT IS 27 ## SEE 9.

6.0 RESTRICTIONS: N/A

7.0 PROGRAM DESCRIPTION/THEORY OF OPERATION:

A. FORMATTER PROGRAM (STARTING ADDRESS <SA> 500)
THE DISK IS FIRST FORMATTED AFTER WHICH A FORMAT DONE MESSAGE IS PRINTED. THEN A 55555 PATTERN

; IS WRITTEN TO THE ENTIRE PACK AND READ BACK 2 TIMES,
; A RANDOM SEEK TEST IS PERFORMED, AND PASS IS PRINTED.
; THE DATA PATTERN IS THEN ROTATED
; 1 BIT AND THE WRITE/READ/READ/SEEK PROCESS IS REPEATED.
; AT THE COMPLETION OF THE NUMBER OF PASSES ENTERED
; BY THE OPERATOR, A LOG IS PRINTED AND THE DRIVES
; ARE RELEASED;

;*****

;-----IT IS RECOMMENDED THAT AT LEAST 3 PASSES (W/R/R/S), WITH
; ON-BOARD ECC SOFTWARE DISABLED, BE ALLOWED TO INSURE PACK
; QUALITY. IF TIME PERMITS, LONGER RUNS WILL FURTHER INSURE
; RELIABILITY.

;*****

;-----ANY HARD DATA OR ADDRESS ERRORS WILL RESULT IN THE
; BAD SECTOR FLAG BEING SET IN THAT SECTOR. ANY
; "SOFT DATA" OR "ADDRESS ERROR" ADDRESS ENCOUNTERED
; TWICE CAUSE THE BAD SECTOR FLAG TO BE SET. ANY OTHER
; ERROR WILL CAUSE THE PROGRAM TO PRINT THE FAILURE TO
; THE TTY AND THE PROGRAM WILL HALT. ##THIS PROGRAM IS NOT
; INTENDED TO BE A RELIABILITY PROGRAM FOR THE DISK SYSTEM
; AND IN GENERAL ASSUMES THE CONTROL AND DRIVE TO BE IN
; WORKING ORDER.

; A HARD ADDRESS ERROR IS DEFINED AS SUCH AFTER TWO
; ATTEMPTS HAVE BEEN MADE BOTH RESULTING IN AN ADDRESS
; ERROR. A HARD DATA ERROR IS DEFINED AS SUCH AFTER
; 2 OR MORE OF 10 WRITE/READ RETRY'S HAVE BEEN
; UNSUCCESSFUL.

; B. CHECK PROGRAM ONLY (SA 501)
; SAME AS SA 500 EXCEPT THAT INITIAL PACK FORMAT
; OPERATION IS BYPASSED.

; C. STATISTICS
; TYPE L FOR 1ST 200. DISK ADDRESSES OF BAD SECTORS,
; DATA AND ADDRESS ERRORS, PLUS A STATISTIC TABLE OF
; OVERALL ERRORS.
; **NOTE** ANY CHARACTER TYPED WHILE EXECUTING
; THIS LOG WILL END IT AT THE NEXT CHANGE OF
; DATA TYPE.

; D. LOG RECOVERY (SA 502)
; USE TO RECOVER LOG IF PROGRAM WAS STOPPED BEFORE
; LOG PRINTOUT.

; E. COMMAND STRING INTERPRETER (SA 503)
; AS A TROUBLE SHOOTING AID THE SERVICE
; ENGINEER MAY TYPE IN HIS OWN TEST LOOP.
; AFTER STARTING AT 503, THREE ARGUMENTS
; MUST BE ENTERED IN RESPONSE TO THREE
; PROGRAM QUESTIONS; "UNIT", "DATA", AND
; "COMMAND STRING". ALL NUMBERS MUST ENTERED
; IN OCTAL.

; I. UNIT: TYPE UNIT # OR CARRIAGE TO
; USE THE PREVIOUS ENTRY

; II. DATA: RAN=RANDOM
; ALO=ALL ONES
; ALZ=ALL ZEROS
; PAT=110110 PATTERN
; FLO=FLOATING ONE PATTERN
; FLZ=FLOATING ZERO PATTERN
; ADR=ALTERNATING CYLINDER AND

HEAD, SECTOR WORDS
VAR=EXISTING WORDS ENTERED PREVIOUSLY AS
DESCRIBED BELOW

ALTERNATIVELY ENTER A STRING OF UP TO 7
OCTAL 16 BIT WORDS TO BE
USED AS DATA. THE WORDS
ENTERED ARE USED REPEATEDLY
TO MAKE UP A SECTOR BLOCK.
TYPE CARRIAGE TO USE THE
PREVIOUS ENTRY:

III. COMMAND STRING:

OPTIONS 1. READ HEAD, SECTOR, #SECTORS
2. WRITE SAME
3. SEEK CYLINDER
4. RECALIBRATE
5. LOOP (GO TO BEGINNING OR LR)
6. DELAY N (N=DELAY IN MS)
7. DISABLE (WRITE DISABLE)
8. TRESPASS
9. STOP DISK
10. RELEASE
11. OFF (OFFSET FORWARD)
12. OFR (OFFSET REVERSE)
13. LR (BEGIN LOOP HERE)
14. VERIFY (WRITE)
15. FORMAT CYL, HD, SECTOR
16. BAD (BAD SECTOR) CYL, HD, SECTOR
17. MEMORY ADDR, DATA(WRITE) (CONTROLLER MEMORY COMMAND)
18. TYPE CARRIAGE RETURN TO USE THE
PREVIOUS COMMAND STRING.

NOTE THAT EITHER SPACES OR A COMMA
MAY BE USED AS AN ARGUMENT DELIMITER.
EACH RESPONSE IS TERMINATED BY
TYPING CARRIAGE RETURN. IF MORE
ROOM IS NEEDED ON A LINE, TYPE
LINE FEED TO SPACE TO THE NEXT LINE.
THE WORD "SAME" USED WITH READ, OR WRITE,
WILL CAUSE THE PREVIOUS DISK
ADDRESS PARAMETERS TO BE USED.

AN R TYPED WHILE A STRING IS BEING EXECUTED WILL
CAUSE THE PROGRAM TO RETURN TO COMMAND STRING START.
THE ESCAPE KEY WILL BYPASS UNIT AND DATA PROMPTS TO
THE COMMAND STRING PROMPT.

THE FOLLOWING EXAMPLE WOULD CAUSE UNIT
1 TO SEEK CYLINDER 50, THEN REPEATEDLY
WRITE SECTORS 2 AND 3 OF HEAD 5,
THEN READ IT BACK AND CHECK. DATA IS SPECIFIED
AS ALTERNATE WORDS OF ZEROS THEN ONES.

UNIT: 1
DATA: 0,177777
COMMAND STRING: SEEK 50 LR WRITE 5,2,2 READ SAME LOOP

THE FOLLOWING EXAMPLE WOULD WRITE ZERO TO
CONTROLLER MEMORY LOCATION 1500 (OCTAL)

UNIT: 1
DATA: N/A

COMMAND STRING: MEMORY 101500,0
NOTE: UPPER MEMORY BIT = 1 DEFINES A WRITE

SWITCH SETTINGS
S?WPD 8

SWITCH OPTIONS
DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION
"SWREG" IS AS FOLLOWS:

BIT	OCTAL VALUE	BINARY VALUE	INTERPRETATION
1		0	LOOP ON ERROR
	40000	1	SKIP LOOPING ON ERROR
2		0	PRINT TO CONSOLE
	20000	1	ABORT PRINT OUT TO CONSOLE
5		0	DO NOT PRINT ON THE LINE PRINTER
	02000	1	PRINT ON THE LINE PRINTER
11(B)		0	N/A
	00020	1	ENABLE BAD SECTOR PRINTOUT

OPERATING PROCEEDURE/OPERATOR INPUT:

A. VERIFY DRIVE (DRIVES) ARE READY ON-LINE
B. LOAD PROGRAM USING BINARY LOADER
C. TO RUN OTHER THAN TEST 500, ENTER CONTROL "0"
AT 9.2, ENTER STARTING ADDRESS FOLLOWED BY AN "R"

STARTING ADDRESS (SA)

200 READ UNIT CHARACTERISTICS AND THEN RUN FORMATTER (500)
500 FORMATTER/CHECK PROGRAM
501 CHECK PROGRAM ONLY
502 ERROR LOG RECOVERY (SEE 7.B,BA)
503 COMMAND STRING INTERPRETER

OPERATOR IS REQUESTED TO ENTER DEVICE CODE OF
CONTROLLER (DEFAULT 27)

OPERATOR IS REQUESTED TO SET SWPAK FOLLOWED
BY A CARRIAGE RETURN (SEE 8.3)

MONTH, DAY, YEAR (I.E. 77...), HOUR, & MIN
(IF [CR] IS GIVEN THIS ROUTINE IS BYPASSED)

ENTER # OF PASSES FOR TEST COMLETION (IF [CR] IS
GIVEN THIS ROUTINE IS BYPASSED)

OPERATOR IS REQUESTED TO ENTER YES/NO TO CONTROLLER
CORRECTION, IF IT IS ENABLED

UNIT NUMBERS, TYPES, AND THEIR CHARACTERISTICS
ARE THEN DISPLAYED, "PLEASE VERIFY"

OPERATOR IS THEN REQUESTED TO ENTER
UNIT NUMBERS TO BE TESTED(0-3)

OPERATOR IS THEN REQUESTED TO ENTER
TYPE OF DISK (USER DEFINED ENTER 10)

A. IF TYPE ENTERED DID NOT MATCH, ENTER 0
1 2 OR 3 TO RE-DEFINE A DISK TYPE

B. # OF HEADS FOR NEW TYPE (IN DECIMAL)

C. # OF CYLINDERS FOR NEW TYPE (IN DECIMAL)

D. # OF SECTORS FOR NEW TYPE (IN DECIMAL, CANNOT BE DOWNSIZED)

E. RETURN TO 9.7

OPERATOR INPUT CONTROLLED PRINTOUTS ARE AS FOLLOWS:

L = FIRST 200. BAD SECTORS, DATA, OR ADDRESSES
ALSO LISTED IS A COUNT FOR CONTROLLER
CORRECTS/UNIT (ON BOARD ECC CORRECTION AND OFFSET CORRECTS)

;10.0 PROGRAM OUTPUT/ERROR DESCRIPTION:

1. ERRORS- ERROR STATUS IS PRINTED
WHENEVER ENCOUNTERED. WHEN DATA ERRORS
ARE FOUND ONLY THREE ARE PRINTED PER
ENCOUNTER. (SEE PARAGRAPH 10.3)

2. IF ERRORS ARE ENCOUNTERED MORE THAN ONCE,
A COUNT WILL BE RECORDED AND A BAD SECTOR FLAG SET.
ALL ADDRESS INFO. WILL BE PRINTED IN OCTAL.

3. ERROR REPORTING AND RECOVERY

ALL ERRORS ARE IDENTIFIED, AND THE
PROGRAM IS ROUTED VIA BASE TO A CALL TO CKSW.
WITH THE EXCEPTION OF ADDRESS AND DATA ERRORS
THE PROGRAM WILL THEN LOOP FOR OPERATOR INTERVENTION,
ON THE BASIS OF SWPAK (SEE 8.)

RECALIBRATE - ANY UNUSUAL STATUS IS REPORTED
IMMEDIATELY AND AN ERROR RETURN EXECUTED.

SEEK - POSITIONER FAULT STATUS RESULTS
IN STATUS PRINTOUT AND ERROR RETURN.

WRITE - FOLLOWING "DONE" ON A WRITE, ERRORS ARE
CHECKED IN THE SEQUENCE SHOWN BELOW. ERROR
RECOVERY PROCEDURE IS OUTLINED FOR EACH CASE.
IF THE ERROR IS NOT PRESENT THE NEXT CHECK IS MADE.

DRIVE STATUS (DIB) IS CHECKED 1ST FOR BOTH READ AND
WRITE BEFORE ANY DIA CHECKS ARE MADE

4. READ/WRITE TIMEOUTS, DATA LATE, ILLEGAL SECTOR,
ECC(DATA OK), OR ANY DRIVE FAULT- PRINT THE ILLEGAL
STATUS AND DO AN ERROR RETURN.

5. ADDRESS ERROR- REPEAT THE WRITE, IF TEST PASSES
THE SECOND TIME, DO A NORMAL RETURN; OTHERWISE
FLAG AS HARD, SET THE BAD SECTOR FLAG FOR THAT SECTOR
AND DO AN ERROR RETURN.

IF A HARD CYLINDER ADDRESS ERROR OCCURS, A READ
ON AN ADJACENT HEAD WILL BE ATTEMPTED TO DETERMINE
WHETHER THE FAULT SHOULD BE CLASSED AS A SEEK ERROR
OR AN ADDRESS ERROR. THE FIRST 30. HARD ADDRESS
ERRORS WILL HAVE THEIR ADDRESSES LOGGED.

6. ENDING MEMORY ADDRESS -PRINT THE ERROR MESSAGE,
CHECK FOR A DISK ADDRESS AND DO AN ERROR RETURN.

7. ENDING DISK ADDRESS -PRINT THE ERROR MESSAGE AND
DO AN ERROR RETURN.

READ - ALL READ ERRORS WITH THE EXCEPTION OF DATA RELATED
ERRORS ARE HANDLED THE SAME AS DESCRIBED FOR THE WRITE
OPERATIONS

; DATA ERRORS - DATA IS REREAD 9 TIMES.
;
; IF DATA IS BAD ON 2 OR MORE OF
;
; 10 TRIES, A HARD ERROR COUNT IS INCREMENTED,
; THE BAD SECTOR FLAG IS SET IN THAT SECTOR, AND AN
; ERROR RETURN IS TAKEN. IF DATA IS GOOD ON ALL RETRIES,
; THE ERROR IS CONSIDERED SOFT AND A NORMAL RETURN IS
; TAKEN.

; THE 1ST 200. DATA ERRORS (HARD OR SOFT) ARE LOGGED.
;11.0 DEBUG HELP:
O?DTD 11

;12.0 SPECIAL NOTES/SPECIAL FEATURES:

; 1. THE PROGRAM IS NOT! A MAINTENANCE PROGRAM
; AND ASSUMES THE HARDWARE TO BE IN WORKING ORDER.
; THE PROGRAM WILL HALT ON ANY NON-DATA RELATED
; ERRORS. ALTHOUGH PRESSING CONTINUE WILL ALLOW
; THE PROGRAM TO PROCEED, IT IS NOT RECOMMENDED
; THAT THE PROGRAM BE RUN UNDER THESE CONDITIONS.

; 2. IT IS RECOMMENDED THAT AT LEAST 3 PASSES (W/R/R/S)
; BE ALLOWED (SEE BELOW) TO INSURE PACK QUALITY.
; IF TIME PERMITS, LONGER RUNS WILL FURTHER
; INSURE QUALITY.

;13.1 PROGRAM RUNTIME:

; PROGRAM RUNTIMES ARE SUBSTANTIALLY REDUCED WITH
; MEMORIES OF 24K OR LARGER. RUNTIMES ARE ALSO
; DEPENDANT ON CPU TYPE, DRIVE SIZE AND DRIVE TYPE.

; 3 PASSES AFTER FORMAT ARE RECOMMENDED FOR
; SURFACE VERIFICATION:

; READ, WRITE AND SEEK OPERATIONS ARE TIMED
; BY SPECIAL ROUTINES. WHEN THE PROGRAM IS
; FIRST STARTED, THE TIMING ROUTINE WILL TEST
; FOR THE PRESENCE OF A REAL TIME CLOCK (RTC)
; TO DERIVE TIMING FROM IT.

;EOT

DESCRIPTION: ZETACO SMD DISK CONTROLLER RELIABILITY PROGRAM

Product of ZETACO, 1984

.....TITLE.....DISKR.....

.DUSR X=1

.NOMAC X

;1.0 PROGRAM NAME: DISKR.SR

;2.0 REVISION HISTORY:

REV.	DATE	
00	02/09/83	
01	09/07/83	;S120 # SKP TOGETHER, STACK AND ;AOS BOOTSTRAP AT 400, NO VERIFY ;WITH RANDOM DATA TEST 502 SWT 10
02	03/28/84	;ADD RELEASE COMMAND TO RC ;FOR DUAL PORT, DAISY CHAIN ;DISK SECTOR PULSE COUNTER ;DEVICE CODE CHANGE ROUTINE ;502 PAT 24 SECTOR ;ZDF1,
03	05/30/84	
04	08/21/85	;DISABLE VIRTUAL, UP TO 2048. ;CYLS, 40 HDS

;3.0 MACHINE REQUIREMENTS:

NOVA/ECLIPSE FAMILY CENTRAL PROCESSOR
16K READ/WRITE MEMORY
TELETYPE OR CRT DISPLAY
ZETACO SMD DISK CONTROLLER
0-3 DISK DRIVES

;4.0 TEST REQUIREMENTS: N/A

;5.0 SUMMARY:

THE ZETACO DISK CONTROLLER RELIABILITY PROGRAM IS A MAINTENANCE PROGRAM DESIGNED TO EXERCISE AND TEST THE ZETACO SMD DISK SUB-SYSTEMS AND 1-4 DISK DRIVES. THE DISK DRIVES MAY BE SHARED BETWEEN TWO COMPUTERS IN WHICH CASE THE FOLLOWING PROGRAMS MAY BE RUNNING IN EACH COMPUTER:

STARTING ADRESSES'S (SA) 500,501 RANDOM RELIABILITY SA 503 COMMAND STRING (IF A RELEASE COMMAND IS INCLUDED IN THE COMMAND STRING)

THE CONTROL CAN BE ANY DEVICE CODE 20-76 OCTAL. THE DEFAULT IS 27 -SEE 9.1 FOR OTHER SETTINGS

;6.0 RESTRICTIONS:

1. THE DISK DRIVES MAY BE

; SHARED BETWEEN TWO COMPUTERS IN WHICH CASE
; THE FOLLOWING PROGRAMS MAY BE RUNNING IN EACH
; COMPUTER:

; STARTING ADDRESSES'S (SA) 500,501 RANDOM RELIABILITY
; SA 503 COMMAND STRING (IF A RELEASE COMMAND IS
; INCLUDED IN THE COMMAND STRING)

; IF NO DRIVES ARE TO BE SHARED, THERE ARE NO OTHER
; RESTRICTIONS AS TO THE RUNNING OF THESE PROGRAMS ON
; A DUAL PROCESSOR SYSTEM.

; 2. ANY COMBINATION OF DRIVES
; MAY BE TESTED BY THIS PROGRAM AT A SINGLE TIME.

;7.0 PROGRAM DESCRIPTION/THEORY OF OPERATION:

; A. RELIABILITY TEST (SA 500)

; A RANDOM NUMBER GENERATOR IS USED TO SELECT A
; DISK DRIVE,CYLINDER,HEAD,BEGINNING SECTOR,
; AND NUMBER OF CONSECUTIVE SECTORS. RANDOM
; DATA IS THEN GENERATED, WRITTEN, AND READ.
; THE SEQUENCE IS REPEATED INDEFINITELY.
; IF RUNNING MULTIPLE UNITS, OVER LAPPED SEEKS ARE
; EMPLOYED IF THE NEXT RANDOM UNIT IS DIFFERENT FROM
; THE CURRENT UNIT UNDER I/O EXECUTION.

; B. RELIABILITY TEST (SA 501) WITH OPTIONS

; SAME AS A, EXCEPT THAT OPERATOR IS GIVEN
; OPTIONS ON DATA PATTERNS (SEE 7D 11)
; AND MAY CHOOSE A CONSTANT CYLINDER,HEAD,SECTOR
; OR # OF SECTORS. ANY LETTER RESPONSE TO CYL,HEAD ETC.
; GETS RANDOM FUNCTION FOR THAT VARIABLE. A CARRIAGE
; RETURN ONLY GETS THE RANDOM FUNCTION FOR ALL VARIABLES.

; THE OPERATOR IS ALSO ASKED TO RESPOND TO
; JITTER OPTION(YES/NO). IF YES, A RANDOM DELAY(0-40,50MS)
; IS INSERTED INTO THE BACKGROUND LOOP TO CREATE
; A MORE ASYNCHRONOUS DISK I/O LOOP.

; C. INCREMENTAL DISK ADDRESS TEST (SA 502)

; OPERATOR IS GIVEN OPTION ON DATA (SEE 7D 11)
; REQUESTED DATA IS FIRST WRITTEN (SEE SWPAK10) OVER
; THE ENTIRE PACK. THEN THE DATA IS READ FROM
; ALL SECTORS . THIS INSURES THAT ALL DISK
; PACK BLOCKS ARE USEABLE AND ARE FORMATTED
; PROPERLY. THE TEST IS THEN REPEATED FOR ALL
; READY DISCS; AND PASS IS PRINTED. THE
; SEQUENCE IS REPEATED INDEFINITELY.

; #NOTE

; SWPAK7=1, PROGRAM WAITS AFTER WRITE WITH READ
; VERIFICATION ALLOWING OPERATOR TO CHANGE PACKS.
; SWPAK8=1; PUTS PROGRAM INTO READ ONLY MODE
; ## SA'S 501,502 ONLY. IF SA 501-DATA MUST INOTI BE
; RANDOM (SEE 7D 11).

; ALL NUMBERS ENTERED ABOVE MUST BE IN OCTAL.
; ANY NON-OCTAL INPUT IS TREATED AS A LETTER.
; ANY LETTER INPUT FOR CYL,HEAD,SECTOR, OR # OF

; SECTORS GETS RANDOM FUNCTION IN THE RELIABILITY
; TEST WITH OPTIONS.

; D. COMMAND STRING INTERPRETER (SA 503)
; AS A TROUBLE SHOOTING AID THE SERVICE
; ENGINEER MAY TYPE IN HIS OWN TEST LOOP.
; AFTER STARTING AT 503, THREE ARGUMENTS
; MUST BE ENTERED IN RESPONSE TO THREE
; PROGRAM QUESTIONS; "UNIT", "DATA", AND
; "COMMAND STRING". ALL NUMBERS MUST ENTERED
; IN OCTAL.

; I. UNIT: TYPE UNIT # OR CARRIAGE TO
; USE THE PREVIOUS ENTRY

; II. DATA: RAN=RANDOM

; ALO=ALL ONES
; ALZ=ALL ZEROS
; PAT=155555 PATTERN
; ROT=155555 PATTERN ROTATED ON
; SUCCESSIVE PASSES.
; ALT=52525 PATTERN
; FLO=FLOATING ONE PATTERN
; FLZ=FLOATING ZERO PATTERN
; ADR=ALTERNATING CYLINDER AND
; HEAD, SECTOR WORDS
; VAR=EXISTING WORDS ENTERED PREVIOUSLY AS
; DESCRIBED BELOW

; ALTERNATIVELY ENTER A STRING OF UP TO 7
; OCTAL 16 BIT WORDS TO BE
; USED AS DATA. THE WORDS
; ENTERED ARE USED REPEATEDLY
; TO MAKE UP A SECTOR BLOCK.
; TYPE CARRIAGE TO USE THE
; PREVIOUS ENTRY.

; III. COMMAND STRING:

; OPTIONS 1. READ HEAD, SECTOR, #SECTORS
; 2. WRITE SAME
; 3. SEEK CYLINDER
; 4. RECALIBRATE
; 5. LOOP (GO TO BEGINNING OR LR)
; 6. DELAY N (N= DELAY IN MS)
; 7. DISABLE (WRITE DISABLE)
; 8. TRESPASS
; 9. STOP DISK
; 10. RELEASE
; 11. OFF (OFFSET FORWARD)
; 12. OFR (OFFSET REVERSE)
; 13. LR (BEGIN LOOP HERE)
; 14. VERIFY (WRITE)
; 15. MEMORY ADDR; DATA (WRITE) (CONTROLLER MEMORY COMMAND)
; 16. TYPE CARRIAGE RETURN TO USE THE
; PREVIOUS COMMAND STRING.

; NOTE THAT EITHER SPACES OR A COMMA
; MAY BE USED AS AN ARGUMENT DELIMITER.
; EACH RESPONSE IS TERMINATED BY
; TYPING CARRIAGE RETURN. IF MORE
; ROOM IS NEEDED ON A LINE, TYPE
; LINE FEED TO SPACE TO THE NEXT LINE.

; THE WORD "SAME" USED WITH READ, OR WRITE,
; WILL CAUSE THE PREVIOUS DISK
; ADDRESS PARAMETERS TO BE USED.

; AN R TYPED WHILE A STRING IS BEING EXECUTED
; WILL CAUSE THE PROGRAM TO RETURN TO THE
; COMMAND STRING START. THE ESCAPE KEY WILL
; BYPASS THE UNIT AND DATA PROMPTS TO THE
; COMMAND STRING PROMPT.

; THE FOLLOWING EXAMPLE WOULD CAUSE UNIT
; 1 TO SEEK CYLINDER 50, THEN REPEATEDLY
; WRITE SECTORS 2 AND 3 OF HEAD 5,
; THEN READ IT BACK AND CHECK. DATA IS SPECIFIED
; AS ALTERNATE WORDS OF ZEROS THEN ONES.

; UNIT: 1
; DATA: 0,177777
; COMMAND STRING: SEEK 50 LR WRITE 5,2,2 READ SAME LOOP

; THE FOLLOWING EXAMPLE WOULD WRITE ZERO TO
; CONTROLLER MEMORY LOCATION 1500 (OCTAL)

; UNIT: 1
; DATA: N/A
; COMMAND STRING: MEMORY 101500,0
; NOTE: UPPER MEMORY BIT = 1 DEFINES A WRITE

; E. QUICKIE FORMATTER (SA 504)
; FORMATS PACK AND HALTS. THERE IS NO VERIFY,
; NO FLAGS ARE SET, AND NO ERROR CHECKING.

; F. RUNALL (SA 505)
; PROGRAM ALTERNATES BETWEEN THE PROGRAMS DESCRIBED
; IN 7.B(4 DATA PATTERNS -PAT,RAN,FLZ,FLO) AND
; 7.C(6 DATA PATTERNS -PAT,RAN,ADR,ALT1,ZEROES,ONES)
; AND 7.H, AND IN THAT ORDER.

; G. SEEK EXERCISER (SA 506)
; PROGRAM PROVIDES A SEEK SCAN SEQUENCE
; CONVERGING FROM THE EXTREME OUTERMOST TRACKS INTO THE
; ADJACENT TRACK IN THE CENTER, THEN DIVERGING AGAIN TO
; THE EXTREMES.

; H. RANDOM SEEK EXERCISER (SA 507)
; PROGRAM PROVIDES A RANDOM SEEK SEQUENCE

; ###G,H ALL SEEKS IN G/H ARE FOLLOWED BY A 1 SECTOR READ
; BUT WITH NO DATA CHECK. ALL SEEKS ARE TIMED
; WITH MAX,MIN, AND AVE. TIMES BEING LOGGED IN MS.
; SEEK PATHS FOR MAX,MIN VALUES ARE ALSO LOGGED.
; ###CAUTION -ECC ERRORS WILL RESULT IN SA'S 506,507 IF
; PACK IS NOT 1ST WRITTEN AFTER FORMATTING.

; I. ERROR COUNT/LOG RECOVERY (SA 510)
; IN THE EVENT A PROGRAM WAS STOPPED DURING A RUN, THE
; ERROR LOGS MAY BE RECOVERED AT THIS STARTING ADDRESS.
; ***MUST BE DONE BEFORE ANY PROGRAM RESTART AS PROGRAM
; INITIALIZATION ZEROES ALL LOGS.

;8. SWITCH SETTINGS
; S?WPD 8
;8.3 SWITCH OPTIONS

DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION
"SWREG" IS AS FOLLOWS:

BIT	OCTAL VALUE	BINARY VALUE	INTERPRETATION
1	40000	0 1	LOOP ON ERROR SKIP LOOPING ON ERROR
2	20000	0 1	PRINT TO CONSOLE ABORT PRINT OUT TO CONSOLE
4	04000	0 1	PRINT PASS DO NOT PRINT PASS
5	02000	0 1	DO NOT PRINT ON THE LINE PRINTER PRINT ON THE LINE PRINTER
6	01000	0 1	DO NOT EXIT TO ODT ON ERROR EXIT TO ODT ON ERROR
7	00400	0 1	**** N/A BREAK FOR PACK INTERCHANGE
8	00200	0 1	**** N/A FOR READ ONLY MODE (SA 501,502)
9	00100	0 1	N/A BYPASS DATA CHECK
10(A)	00040	0 1	N/A DO VERIFY AFTER WRITE (SA 502 ONLY AND NOT RANDOM DATA)
11(B)	00020	0 1	N/A ENABLE BAD SECTOR PRINTOUTS
12(C)	00010	0 1	N/A HALT ON DRIVE ERROR PRIOR TO RECOVERY RECALIBRATE OPERATION
13(D)	00004	0 1	NO TRACE TRACE PRINTOUT ON ERROR

;9.0 OPERATING PROCEEDURE/OPERATOR INPUT:

- A. VERIFY DRIVE (DRIVES) ARE READY ON-LINE
- B. LOAD PROGRAM USING BINARY LOADER
- C. TO RUN OTHER THAN TEST 505, ENTER CONTROL "0"
AT 9.2, ENTER STARTING ADDRESS FOLLOWED BY AN "R"

STARTING ADDRESS

200	READ UNIT CHARACTERISTICS AND THEN RUN ALL TEST (505)
500	RELIABILITY TEST; ALL CYLINDERS
501	RELIABILITY TEST, (OPTIONS)
502	INCREMENTAL DISK ADDRESS TEST
503	COMMAND STRING INTERPRETER
504	QUICKIE FORMATTER
505	RUN ALL
506	SEEK EXERCISER (CONVERGING, DIVERGING PATTERN)
507	SEEK EXERCISER (RANDOM PATTERN)
510	ERROR COUNT/LOG RECOVERY

;9.1 OPERATOR IS REQUESTED TO ENTER DEVICE CODE OF


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; CONTROLLER (DEFAULT IS 27)
;9.2 STARTING ADDRESS IS DISPLAYED AND
; OPERATOR IS REQUESTED TO SET SWPAK FOLLOWED
; BY A CARRIAGE RETURN (SEE 8:3)
;9.3 OPERATOR IS REQUESTED TO ENTER YES/NO TO
; EXERCISE MAPS, IF PRESENT
; 9.4 DATE -DAY, MONTH, YEAR (I.E. 77...), HOUR, & MINUTE (A [CR]
; RESPONSE WILL IGNORE THIS ROUTINE)
;9.5 OPERATOR IS REQUESTED TO ENTER YES/NO IF ANY
; DUAL VOLUME DRIVES (CMD'S)
;9.6 OPERATOR IS REQUESTED TO ENTER YES/NO TO CONTROLLER
; CORRECTION, IF IT IS ENABLED
;9.7 UNIT NUMBERS, TYPES, AND THEIR CHARACTERISTICS
; ARE THEN DISPLAYED, "PLEASE VERIFY"
; OPERATOR IS THEN REQUESTED TO ENTER
; UNIT NUMBERS TO BE TESTED (0-3)
;9.8 OPERATOR IS THEN REQUESTED TO ENTER
; TYPE OF DISK (USER DEFINED ENTER 10)
; A. IF TYPE ENTERED IS 10, ENTER 0
; 1 2 OR 3 TO RE-DEFINE A DISK TYPE
; B. # OF HEADS FOR NEW TYPE (IN DECIMAL)
; C. # OF CYLINDERS FOR NEW TYPE (IN DECIMAL)
; D. # OF SECTORS FOR NEW TYPE (IN DECIMAL, CANNOT BE DOWNSIZED)
; E. RETURN TO 9.7

; ## A [CR] ONLY RESPONSE TO UNIT NUMBERS, WILL LEAVE
; UNIT INFORMATION IN PREVIOUS STATE.

; ## A [CR] ONLY RESPONSE TO YES/NO WILL
; DEFAULT TO NO

; OPERATOR INPUT CONTROLLED PRINTOUTS ARE AS FOLLOWS:

; L = FIRST 100. BAD SECTORS, DATA, OR ADDRESSES
; S = SEEK TIMING STATISTICS (506,507 ONLY)
; W = SECTORS W/R, ERROR COUNTS, AND ON BOARD ECC AND OFFSET CORRECT
; **NOTE** ANY CHARACTER TYPED WILL END PRINTOUTS AT THE
; NEXT CHANGE OF DATA TYPE.

; D. OPERATING MODES

; 1 OF 4 DIFFERENT MEMORY/INTERRUPT MODES MAY BE IN USE
; IN THIS PROGRAM AND ARE DESCRIBED AS FOLLOWS:

; 1-BACKGROUND ONLY, WAIT ON INTERRUPT.
; MAX # OF SECTORS = ALL OF AVAILABLE CORE (IE NOT TAKEN
; BY PROGRAM) OR 32 SECTORS MAX. USED FOR SA'S 503,506,507

; 2-BACKGROUND/FOREGROUND MODES, 2 BUFFERS USED FOR
; BOTH READ AND WRITE PURPOSES. MAX # OF SECTORS
; = 1/2 OF AVAILABLE CORE OR 32 SECTORS MAX. USED
; FOR CONSTANT DATA PATTERNS.

; 3.-BACKGROUND/FOREGROUND MODES, 4 BUFFERS ( 2 FOR READ
; AND 2 FOR WRITE). MAX # OF SECTORS =1/3 OF AVAILABLE
; CORE OR 32. MAX. USED FOR VARIABLE DATA(EXPECT ADR).

; 4. -IF THE ECLIPSE OR NOVA-3 MAPS ARE IN THE SYSTEM,
; AND MAPPING IS REQUESTED, ONE OF TWO MAPPING SCHEMES
; WILL BE IN EFFECT.

; 4.1 THE 1ST N PHYSICAL 1K BLOCKS CONTAINING THE PROGRAM
; WILL BE MAPPED TO THE 1ST N 1K LOGICAL BLOCKS IN BOTH
; THE A AND B USER MAPS. THIS MAPPING WILL REMAIN

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; CONSTANT. A 25. K PHYSICAL BLOCK WITH THE
; START 1K DESIGNATED BY THE PROGRAM VARIABLE MPB?N
; WILL BE ALLOCATED TO THE DISK I/O BUFFER AS FOLLOWS:

; THE 25K I/O BUFFER IS DIVIDED INTO 3 NON-CONTIGUOUS
; BUFFERS, 9K OF COMMON (TO BOTH THE A AND B I/O BLOCKS)
; WRITE BUFFER (WAB), 8K OF READ BUFFER ALLOCATED TO THE
; A-I/O BLOCK (RA) VIA THE A USER MAP, AND 8K
; OF READ BUFFER ALLOCATED TO THE B-I/O BLOCK (RB) VIA
; THE B USER MAP. THE 1K BLOCKS OF THE 3 BUFFERS ARE
; INTERLEAVED IN THE PHYSICAL SPACE IN THE FOLLOWING
; MANNER:

; WAB1, RA1, RB1, WAB2, RA2, RB2, WAB3 ETC.

; 4.2 THE 25K PHYSICAL I/O BUFFER IS MAPPED TO THE
; 1ST 25K LOGICAL IN THE DCH MAP. DISPLACEMENT VALUES
; H.DBW, 2 AND H.DBR, 2 ARE ADDED TO THE USER LOGICAL
; ADDRESSES WHEN LOADING THE DCH MEMORY ADDRESS REGISTER.

; 10.0 PROGRAM OUTPUT/ERROR DESCRIPTION:

; ALL ERRORS ARE IDENTIFIED, COUNTED, AND THE
; PROGRAM IS ROUTED VIA BASE TO A CALL TO CKSW.
; ON THE BASIS OF SWITCH SETTINGS (SEE 8.2) THE
; PROGRAM WILL GO INTO A SCOPE LOOP, OR PROCEED,
; DEPENDING ON THE SWPAK SETTINGS.

; UPON LOSS OF READY AND A SINGLE DRIVE, THE PROGRAM
; WILL PRINT THE APPROPRIATE ERROR MESSAGE AND WILL NOT
; PROCEED UNTIL READY IS RETURNED. IF MULTIPLE
; DRIVES EXIST, THE PROGRAM WILL CONTINUE WITH THE
; REMAINING DRIVES. IF THE DOWN DRIVE IS PLACED BACK
; ONLINE, THE PROGRAM WILL RESUME TESTING OF
; THAT DRIVE. THE ABOVE ALSO APPLIES TO THE LOSS
; OF WRITE ENABLE IF THE PROGRAM IS IN A WRITE MODE.

; RECALIBRATE - ANY UNUSUAL STATUS IS REPORTED
; IMMEDIATELY AND AN ERROR RETURN EXECUTED.

; 10.1 SEEK - POSITIONER FAULT STATUS INCREMENTS SEEK
; ERROR COUNTER. ANY ERROR STATUS RESULTS
; IN STATUS PRINTOUT AND ERROR RETURN.
; A RECALIBRATE WILL BE PERFORMED BY THE ERROR HANDLER.
; PROGRAM WILL LOG THE FIRST 20. CYLINDERS
; TO/FROM ON FINDING SEEK ERRORS

; 10.2 WRITE - FOLLOWING "DONE" ON A WRITE, ERRORS ARE
; CHECKED IN THE SEQUENCE SHOWN BELOW. ERROR
; RECOVERY PROCEEDURE IS OUTLINED FOR EACH CASE.
; IF THE ERROR IS NOT PRESENT THE NEXT CHECK IS MADE.

; DRIVE STATUS (DIB) IS CHECKED 1ST FOR BOTH READ AND
; WRITE BEFORE ANY DIA CHECKS ARE MADE

; 1. READ/WRITE TIMEOUTS, DATA LATE, ILLEGAL SECTOR,
; PARITY, DATA VERIFY, OR ANY DRIVE FAULTS- INCREMENT THE
; APPROPRIATE ERROR COUNT, PRINT THE ILLEGAL STATUS
; AND DO AN ERROR RETURN; ANY DRIVE FAULT WILL CAUSE
; A RECALIBRATE TO BE PERFORMED BY THE ERROR HANDLER.

; 2. ADDRESS ERROR- REPEAT THE WRITE, IF TEST PASSES

; THE SECOND TIME, INCREMENT THE SOFT ADDRESS ERROR
; COUNT AND DO A NORMAL RETURN; OTHERWISE INCREMENT
; THE HARD ADDRESS ERROR COUNT AND DO AN ERROR RETURN

; IF A HARD CYLINDER ADDRESS ERROR OCCURS, A READ
; ON AN ADJACENT HEAD WILL BE ATTEMPTED TO DETERMINE
; WHETHER THE FAULT SHOULD BE CLASSED AS A SEEK ERROR
; OR AN ADDRESS ERROR. THE FIRST 20 ADDRESS
; ERRORS WILL HAVE THEIR ADDRESSES LOGGED.

; 3. BAD SECTOR- LOG THE DISK ADDRESS (1ST 100.) AND DO
; A NORMAL RETURN. NO PRINTOUT WILL RESULT UNLESS SW11=1,
; ALTHOUGH THE I/O OPERATION WAS PREMATURELY TERMINATED.
; A "SOFT" ERROR WILL BE RECORDED IF THE SECTOR UNDER
; TEST PASSES AT LEAST 1 OF 4 RETRYS. THE LOG DENOTES
; SOFT ERRORS BY A COUNT GREATER THAN 0; REPRESENTING
; THE ERROR COUNT TALLIED.
; ***SEE 10.3A.

; 4. ENDING MEMORY ADDRESS - INCREMENT THE MEMORY ADDRESS
; ERROR COUNT, PRINT THE ERROR MESSAGE, CHECK FOR A
; DISK ADDRESS ERROR AND DO AN ERROR RETURN

; 5. ENDING DISK ADDRESS - INCREMENT THE DISK ADDRESS
; ERROR COUNT, PRINT THE ERROR MESSAGE, AND
; DO AN ERROR RETURN

; 10.3 READ - ALL READ ERRORS WITH THE EXCEPTION OF DATA RELATED
; ERRORS ARE HANDLED THE SAME AS DESCRIBED FOR THE WRITE
; OPERATIONS

; DATA ERRORS - DATA IS REREAD 3 X (4X IF ECC UNDETECTED)
; IF PROGRAM IS IN WRITE/READ MODE AND DATA IS BAD ALL
; 4 TRIES, A HARD ERROR COUNT IS INCREMENTED AND AN
; ERROR RETURN IS TAKEN. IF DATA IS GOOD ON ANY OF FOUR
; TRIES, A SOFT ERROR COUNT IS INCREMENTED AND A
; NORMAL RETURN IS TAKEN

; IF THE PROGRAM IS IN A READ ONLY MODE (IE. READ MODE
; FOR ANY 502 PROGRAM OR WHEN 505 IS RUNNING A 502
; PROGRAM), THE DATA WILL BE REREAD AN ADDITIONAL
; 4 TIMES IN BOTH OFFSET FORWARD AND OFFSET REVERSE
; MODES BEFORE THE PROBLEM IS CLASSED AS A HARD ERROR

; THUS TOTAL RETRIES FOR A HARD ECC DETECTED ERROR IN
; A READ ONLY MODE IS 12 (13 FOR ECC UNDETECTED), AND
; 4 IF IN A WRITE/READ MODE (5 IF ECC UNDETECTED).
; ***SEE 10.3A

; ANY SUCCESSFUL REREADS WHILE IN AN OFFSET MODE
; WILL BE PRINTED AND LOGGED. THE DISK ADDRESSES
; OF ALL DATA PROBLEMS WILL BE PRINTED AND THE FIRST
; 100. WILL BE LOGGED. THE FIRST THREE GOOD/BAD
; WORD PAIRS AND RESPECTIVE ADDRESSES WILL BE PRINTED.

; IF SWPAK9=1 (BYPASS DATA CHECK) HARD OR SOFT DATA
; ERRORS WILL BE DETERMINED BY ECC STATUS.

; 10.3A ECC (ERROR CORRECTION CODE) ANALYSIS

; ALL READ PASSES INCLUDING RETRIES WILL HAVE THE ECC
; RESULTS LOGGED AS PER THE FOLLOWING 4 CATEGORIES:

; 1. ECC CORRECTED -THE ECC DETECTED AND SUCCESSFULLY
CORRECTED THE DATA ERROR.

; 2. NON-CORRECTABLE ECC -THE ECC DETECTED AND CORRECTLY
DIAGNOSED THE ERROR PATTERN AS UNCORRECTABLE.

; 3. ECC UNDETECTED -THE ECC FAILED TO DETECT A DATA ERROR.
THIS MAY BE A MALFUNCTION OF THE ECC LOGIC; BUT IT IS
MORE LIKELY ONE OF THE FOLLOWING PROBLEMS:

; A FAILURE OF THE DRIVE TO WRITE A SECTOR.
***NOTE- A CHECK SHOULD BE MADE IN THE BAD SECTOR
LOG TO SEE WHETHER A WRITE OPERATION MAY HAVE
ENCOUNTERED A SOFT OR FAULTY BAD SECTOR INDICATION,
WHICH WOULD HAVE TERMINATED THE WRITE.

; A FAILURE IN THE CONTROLLER DATA PATHS.
4. ECC FAILED -TWO CONDITIONS MAY FALL INTO THIS CATEGORY.

; 4A. AN ECC ERROR WAS DETECTED BUT WITH NO ACCOMPANYING
DATA ERROR. A CHECK IS MADE TO SEE WHETHER THE ECC
WORDS POINT TO AN ERROR WITHIN THE TWO APPENDED
WRITE ECC WORDS. IF SUCH AN ERROR IS
DETERMINED TO BE THE CASE, THE ERROR WILL BE LOGGED AS
CORRECTABLE AND NO ECC FAILED MESSAGE WILL RESULT.
THIS TYPE OF ERROR SHOULD REPRESENT ONLY A VERY SMALL
PERCENTAGE OF THE DATA ERRORS (<1% - LARGE SAMPLE). IF
A SIGNIFICANTLY HIGHER PERCENTAGE OF THIS ERROR RESULTS,
THEN AN ECC PROBLEM WOULD BE INDICATED.

; IF THE ECC DOES NOT POINT TO THE TWO APPENDED WRITE ECC
WORDS, THEN AN ECC FAILED MESSAGE (1ST PASS ONLY) WILL
RESULT AND THE ACTUAL ECC WORDS READ FROM THE CONTROLLER
WILL BE PRINTED.

; 4B. AN ECC ERROR WAS DETECTED, BUT THE ECC EITHER FAILED
TO CORRECT A CORRECTABLE ERROR, OR TRIED TO CORRECT AN
UNCORRECTABLE ERROR. THESE CONDITIONS (POSSIBLY CAUSED
BY PROBLEMS OTHER THAN ECC) WILL RESULT IN A PRINTOUT
(1ST PASS ONLY) OF THE SIMULATED WRITE AND SIMULATED
READ ECC WORDS PLUS THE ACTUAL READ ECC WORDS AS READ
FROM THE CONTROLLER.

; THE SIMULATED WRITE ECC WORDS ARE THE RESULT OF A
PROGRAM SIMULATION OF THE ECC LOGIC ON WHAT THE PROGRAM
BELIEVES TO BE THE WRITE DATA (A WRITE ERROR WILL CAUSE
THIS ASSUMPTION TO BE FALSE), AND REPRESENTS WHAT THE
PROGRAM BELIEVES SHOULD HAVE BEEN WRITTEN AS THE ACTUAL
TWO WRITE ECC WORDS ON THE DISK.

; THE SIMULATED READ ECC WORDS ARE THE RESULT OF ANOTHER
PROGRAM SIMULATION OF THE ECC LOGIC ON THE READ DATA
IN MEMORY, AND REPRESENT WHAT THE PROGRAM BELIEVES
SHOULD BE READ FROM THE CONTROLLER AS THE TWO ECC
WORDS. THE ACTUAL READ ECC WORDS ARE THOSE TWO WORDS
AS READ FROM THE DISK CONTROLLER.

;10.4 ERRORS- ERROR STATUS IS PRINTED WHENEVER ENCOUNTERED
AS FOLLOWS:

; 'MODE' UNIT: 'N'
; CYL- 'N' HEAD 'N' SECT 'N' #SECT 'N'
; DIA/DIB STATUS= 'N' 'DESCRIPTIVE MESSAGE'

; WHERE CYL, HEAD, SECT REFER TO THE FINAL DISK ADDRESS AT
; THE POINT OF ERROR; AND #SECT REFERS TO THE NUMBER OF
; SECTORS ALREADY DONE IN THE MULTIPLE SECTOR TRANSFER.

; WHEN DATA ERRORS ARE FOUND, ONLY THREE ARE PRINTED PER
; ENCOUNTER PLUS THE TOTAL NUMBER OF ERRORS. (SEE PARA 5)
; IF THE DATA ERROR IS ECC UNDETECTED AND THE SYSTEM IS
; MAPPED, THE MAP, PHYSICAL 1K ADDRESS, AND THE DCH
; LOGICAL ADDRESSES ARE ALSO PRINTED.

; WHEN LOOPING IS INVOLVED (RETRIES OR FOR SCOPING)
; STATUS IS PRINTED ON THE 1ST PASS ONLY.

;10.5 STATISTICS - TYPE A W
; DURING RANDOM TESTING TO GET A REPORT OF THE
; NUMBER OF SECTORS WRITTEN (AND/OR) READ, PLUS
; ERROR COUNTS IN DECIMAL. ALSO LISTED IS A
; COUNT FOR CONTROLLER CORRECTS/UNIT
; (ON BOARD ECC CORRECTION AND OFFSET CORRECTS)

; TYPE L FOR FIRST 100. DISK ADDRESSES OF BAD SECTORS AND
; DATA ERRORS; AND FIRST 20. OF ADDRESS ERRORS AND
; SEEK ERRORS (SEEK PATH). IF ERROR ADDRESSES ARE
; ENCOUNTERED MORE THAN ONCE (1ST PASS), A COUNT OF UP TO
; 32. WILL BE RECORDED IN THE LOG. ALSO A COUNT OF UP TO
; 15. HARD ERRORS WILL BE RECORDED. THIS COUNT WILL BE
; A SUBSET OF THE THE FIRST COUNT.

; THE ADDRESS INFORMATION WILL BE IN OCTAL WHILE THE
; COUNTS WILL BE DECIMAL.

; TYPE S FOR SEEK TIMING STATISTICS IF RUNNING
; EITHER SEEK EXERCISER.

; **** NOTE ****

; THE PROGRAM WILL ACCOUNT FOR UP TO A MAX.
; OF 2**31 SECTORS WRITTEN OR READ; SPECIAL
; TEST RUNS EXCEEDING THIS FACILITY WILL
; REQUIRE AN OPERATOR'S TEST LOG TO AUGMENT
; SOFTWARE ACCOUNTING. 2**31 SECTORS =
; APPROX. 5.5* 10**11 WORDS.

;11.0 DEBUG HELP:
O?DTD 11

;12.0 SPECIAL NOTES/SPECIAL FEATURES:

; 1. A CR ONLY RESPONSE TO UNIT NUMBERS, WILL LEAVE
; UNIT/CYLINDER INFORMATION IN PREVIOUS STATE.

; 2. THE PROGRAM USES A 10 WORD BUFFER.

; 3. THE PROGRAM WILL ACCOUNT FOR UP TO A MAX.
; OF 2**31 SECTORS WRITTEN OR READ. SPECIAL
; TEST RUNS EXCEEDING THIS FACILITY WILL
; REQUIRE AN OPERATOR'S TEST LOG TO AUGMENT
; SOFTWARE ACCOUNTING. 2**31 SECTORS =
; APPROX. 5.5* 10**11 WORDS.

; 4. SWPAK7=1, PROGRAM HALTS AFTER WRITE WITH READ
; VERIFICATION ALLOWING OPERATOR TO CHANGE PACKS.
; SWPAK8=1; PUTS PROGRAM INTO READ ONLY MODE
; ## SA'S 501,502 ONLY. IF SA 501-DATA MUST INOTI BE
; VARIABLE. START AT THE ABOVE SELECTED ADDRESS.

; 5. ALL NUMBERS ENTERED IN 7.0 MUST BE IN OCTAL.
; ANY NON-OCTAL INPUT IS TREATED AS A LETTER.
; ANY LETTER INPUT FOR CYL, HEAD, SECTOR, OR # OF
; SECTORS GETS RANDOM FUNCTION IN THE RELIABILITY
; TEST WITH OPTIONS.

; 6. AT TIMES THE ECC MAY ATTEMPT TO CORRECT A NON-CORRECTABLE
; DATA ERROR AND THE SIMULATED ECC AND ACTUAL ECC WILL
; MATCH EVEN THOUGH AN ECC FAILURE WILL HAVE BEEN PRINTED.
; THIS IS DUE TO A FAILURE OF THE ECC POLYNOMIAL ITSELF TO
; DISTINGUISH BETWEEN TWO DIFFERENT ERROR PATTERNS; ONE
; CORRECTABLE AND ONE UNCORRECTABLE. THIS IS NOT A
; HARDWARE FAILURE.

; 13.0 PROGRAM RUNTIME:

; PROGRAM RUNTIMES ARE SUBSTANTIALLY REDUCED WITH
; MEMORIES OF 16K OR LARGER. PROGRAM CAN USE UP TO
; 24K USING 2 BUFFERS AND UP TO 32K USING 4 BUFFERS
; IN THE RANDOM RELIABILITY TESTS. ## SEE 9D

; READ, WRITE AND SEEK OPERATIONS ARE TIMED
; BY SPECIAL ROUTINES. WHEN THE PROGRAM IS
; FIRST STARTED, THE TIMING ROUTINE WILL TEST
; FOR THE PRESENCE OF A REAL TIME CLOCK (RTC)
; TO DERIVE TIMING FROM IT.

PARTS LIST
ZETACO

FOR: INTERNAL A CABLE ASSY 18"

ASSEMBLY #: 300-000-00
REV. LEVEL: C

ITEM	QTY	PART #	GENERIC DESCRIP.	DESCRIPTION	REFERENCE
1	1	025-049-00	CONN F	AMP 204508-3	
2	60	029-012-00	CONN PIN F	AMP 66717-5	
3	1	030-043-00	CONN HDWE	D20418-2 HEX SET	
4	0	020-020-00	CABLE	455-248-60 28 AWG SPECTRA	
5	1	025-041-00	CONN F	3M 3334-6060	
6	1	030-034-00	CONN HDWE	3M 3490-5 PULL TAB	
7	1	099-010-00	LABEL	1/2" X 1 3/4" WHITE PAPER	
8	0	010-001-00	TAPE	3M 850 1"	
9	0	018-029-00	CABLE MATL	805036	

WIRE LIST

NOTES	WIRE GAUGE	COLOR	ORIGIN	TERM. METHOD	DESTINATION	TERM. METHOD	REMARKS
TWP ↑	28 ↑	BRN TAN	P1-1 ↑	MASS ↑	P2-1 P2-2	3 ↑	
		RED TAN			P2-3 P2-4		
		ORG TAN			P2-5 P2-6		
		YEL TAN			P2-7 P2-8		
		GRN TAN			P2-9 P2-10		
		BLU TAN			P2-11 P2-12		
		VIO TAN			P2-13 P2-14		
		GRY TAN			P2-15 P2-16		
		WHT TAN			P2-17 P2-18		
		BLK TAN			P2-19 P2-20		
		BRN TAN			P2-21 P2-22		
		RED TAN			P2-23 P2-24		
		ORG TAN			P2-25 P2-26		
		YEL TAN			P2-27 P2-28		
↓ TWP	↓ 28	GRN TAN	↓ P1-45	↓ MASS	P2-29 P2-30	↓ 3	

ZETACO

TITLE

INTERNAL A CABLE ASSEMBLY

DOCUMENT NO. 300-000-00 thru 300-000-02

SHEET 2 OF 3

REV. C

WIRE LIST

NOTES	WIRE GAUGE	COLOR	ORIGIN	TERM. METHOD	DESTINATION	TERM. METHOD	REMARKS
TWP ↑	28 ↑	BLU TAN	P1-16 ↑	MASS ↑	P2-31 P2-32	3 ↑	
		VIO TAN			P2-33 P2-34		
		GRY TAN			P2-35 P2-36		
		WHT TAN			P2-37 P2-38		
		BLK TAN			P2-39 P2-40		
		BRN TAN			P2-41 P2-42		
		RED TAN			P2-43 P2-44		
		ORG TAN			P2-45 P2-46		
		YEL TAN			P2-47 P2-48		
		GRN TAN			P2-49 P2-50		
		BLU TAN			P2-51 P2-52		
		VIO TAN			P2-53 P2-54		
		GRY TAN			P2-55 P2-56		
		WHT TAN			P2-57 P2-58		
↓ TWP	↓ 28	BLK TAN	↓ P1-60	↓ MASS	P2-59 P2-60	↓ 3	

ZETACO

TITLE

INTERNAL A CABLE ASSEMBLY

DOCUMENT NO. 300-000-00 thru 300-000-02

SHEET 3 **OF** 3 **REV.** C

PARTS LIST
ZETACO

FOR: EXTERNAL B CABLE ASSEMBLY 16'

ASSEMBLY #: 300-011-01
REV. LEVEL: C

ITEM	QTY	PART #	GENERIC DESCRIP.	DESCRIPTION	REFERENCE
----	----	-----	-----	-----	-----
1	1	026-027-00	CONN M	AMP 50P PLUG 205212-3	
2	26	028-008-00	CONN PIN M	AMP 66507-2	
3	1	030-038-00	CONN HDWE	AMP 1-747098-1 13 PR CBL	
4	1	030-037-00	CONN HDWE	AMP 205980-1	
5	1	030-017-00	CONN HDWE	1-745129-7 FERRULE IN	
6	1	030-019-00	CONN HDWE	1-745130-0 FERRULE OUT	
7	0	020-003-00	CABLE	SHIELDED 13 TWP 28 AWG	16 FT
8	1	025-037-00	CONN F	3M 3399-6026	
9	1	030-034-00	CONN HDWE	3M 3490-5 PULL TAB	
10	1	099-011-00	LABEL	SLSH-20375 BRADY RND CBL	

WIRE LIST

NOTES	WIRE GAUGE	COLOR	ORIGIN	TERM. METHOD	DESTINATION	TERM. METHOD	REMARKS
TWP ↑		BRN BLK	P1-1 ↑	MASS ↑	P2-1 P2-2	3 ↑	
		RED BLK			P2-3 P2-4		
		ORG BLK			P2-5 P2-6		
		YEL BLK			P2-7 P2-8		
		GRN BLK			P2-9 P2-10		
		BLU BLK			P2-11 P2-12		
		VIO BLK			P2-13 P2-14		
		GRY BLK			P2-15 P2-16		
		WHT BLK			P2-17 P2-18		
		RED BRN			P2-19 P2-20		
		ORG BRN			P2-21 P2-22		
		YEL BRN			P2-23 P2-24		
↓ TWP		GRN BRN	↓ P1-26	↓ MASS	P2-25 P2-26	↓ 3	

ZETACO

TITLE

EXTERNAL "B" CABLE ASSEMBLY

DOCUMENT NO. 300-011-00 thru 300-011-02

SHEET 2 OF 2 REV. C

PARTS LIST
ZETACO

FOR: EXTERNAL A CABLE ASSEMBLY 16'

ASSEMBLY #: 300-013-01
REV. LEVEL: C

ITEM	QTY	PART #	GENERIC DESCRIP.	DESCRIPTION	REFERENCE
----	----	-----	-----	-----	-----
1	1	026-023-00	CONN M	AMP 204509-3	
2	60	028-009-00	CONN PIN M	AMP 66718-4	
3	1	030-039-00	CONN HDWE	AMP 1-747098-7 30PR CABLE	
4	1	030-037-00	CONN HDWE	AMP 205980-1	
5	1	030-018-00	CONN HDWE	2-745129-3 FERRULE IN	
6	1	030-020-00	CONN HDWE	1-745130-1 FERRULE OUT	
7	0	020-016-00	CABLE	REX T-7978-30PR, 28 AWG	16 FT
8	1	025-041-00	CONN F	3M 3334-6060	
9	1	030-034-00	CONN HDWE	3M 3490-5 PULL TAB	
10	1	099-011-00	LABEL	SLSH-20375 BRADY RND CBL	

WIRE LIST

NOTES	WIRE GAUGE	COLOR	ORIGIN	TERM. METHOD	DESTINATION	TERM. METHOD	REMARKS
TWP ↑		BRN BLK	P1 ↑	MASS	P2-1 P2-2	3 ↑	
		RED BLK			P2-3 P2-4		
		ORG BLK			P2-5 P2-6		
		YEL BLK			P2-7 P2-8		
		GRN BLK			P2-9 P2-10		
		BLU BLK			P2-11 P2-12		
		VIO BLK			P2-13 P2-14		
		GRY BLK			P2-15 P2-16		
		WHT BLK			P2-17 P2-18		
		RED BRN			P2-19 P2-20		
		ORG BRN			P2-21 P2-22		
		YEL BRN			P2-23 P2-24		
		GRN BRN			P2-25 P2-26		
		BLU BRN			P2-27 P2-28		
↓ TWP		VIO BRN	↓ P1	MASS	P2-29 P2-30	↓ 3	

ZETACO

TITLE

EXTERNAL "A" CABLE ASSEMBLY

DOCUMENT NO. 300-013-C0 thru 300-013-02

SHEET 2 OF 3

REV. C

WIRE LIST

NOTES	WIRE GAUGE	COLOR	ORIGIN	TERM. METHOD	DESTINATION	TERM. METHOD	REMARKS
TWP ↑		GRY BRN	P1 ↑	MASS ↑	P2-31 P2-32	3 ↑	
		WHT BRN			P2-33 P2-34		
		ORG RED			P2-35 P2-36		
		YEL RED			P2-37 P2-38		
		GRN RED			P2-39 P2-40		
		BLU RED			P2-41 P2-42		
		VIO RED			P2-43 P2-44		
		GRY RED			P2-45 P2-46		
		WHT RED			P2-47 P2-48		
		YEL ORG			P2-49 P2-50		
		GRN ORG			P2-51 P2-52		
		BLU ORG			P2-53 P2-54		
		VIO ORG			P2-55 P2-56		
		GRY ORG			P2-57 P2-58		
↓ TWP		WHT ORG	↓ P1	↓ MASS	P2-59 P2-60	↓ 3	

ZETACO

TITLE

EXTERNAL "A" CABLE ASSEMBLY

DOCUMENT NO. 300-013-00 thru 300-013-02

SHEET 3 **OF** 3

REV. C

PARTS LIST
ZETACO

FOR: INT DISK B FCC CABLE ASSY 18"

ASSEMBLY #: 300-014-00
REV. LEVEL: E

ITEM	QTY	PART #	GENERIC DESCRIP.	DESCRIPTION	REFERENCE
----	----	-----	-----	-----	-----
1	1	025-030-00	CONN F	AMP 50S RECPT 205211-2	
2	26	029-010-00	CONN PIN F	AMP 66505-2	
3	1	030-043-00	CONN HDWE	D20418-2 HEX SET	
4	0	020-026-00	CABLE	RND CONDCT FL CA 26 POSN	
5	1	025-037-00	CONN F	3M 3399-6026	
6	1	030-032-00	CONN HDWE	3M 3490-2 PULL TAB	
7	1	099-010-00	LABEL	1/2" X 1 3/4" WHITE PAPER	
8	0	010-001-00	TAPE	3M 850 1"	
9	0	018-029-00	CABLE MATL	805036	

WIRE LIST

NOTES	WIRE GAUGE	COLOR	ORIGIN	TERM. METHOD	DESTINATION	TERM. METHOD	REMARKS
	28 ↑	BLU GRY ↑	P1-1	5 ↑	P2-1	2 ↑	
			P1-2		P2-2		
			P1-3		P2-3		
			P1-4		P2-4		
			P1-5		P2-5		
			P1-6		P2-6		
			P1-7		P2-7		
			P1-8		P2-8		
			P1-9		P2-9		
			P1-10		P2-10		
			P1-11		P2-11		
			P1-12		P2-12		
			P1-13		P2-13		
			P1-14		P2-14		
			P1-15		P2-15		
			P1-16		P2-16		
			P1-17		P2-17		
			P1-18		P2-18		
			P1-19		P2-19		
			P1-20		P2-20		
			P1-21		P2-21		
			P1-22		P2-22		
			P1-23		P2-23		
			P1-24		P2-24		
	↓ 28	↓ GRY	P1-25	↓ 5	P2-25	↓ 2	
			P1-26		P2-26		

ZETACO

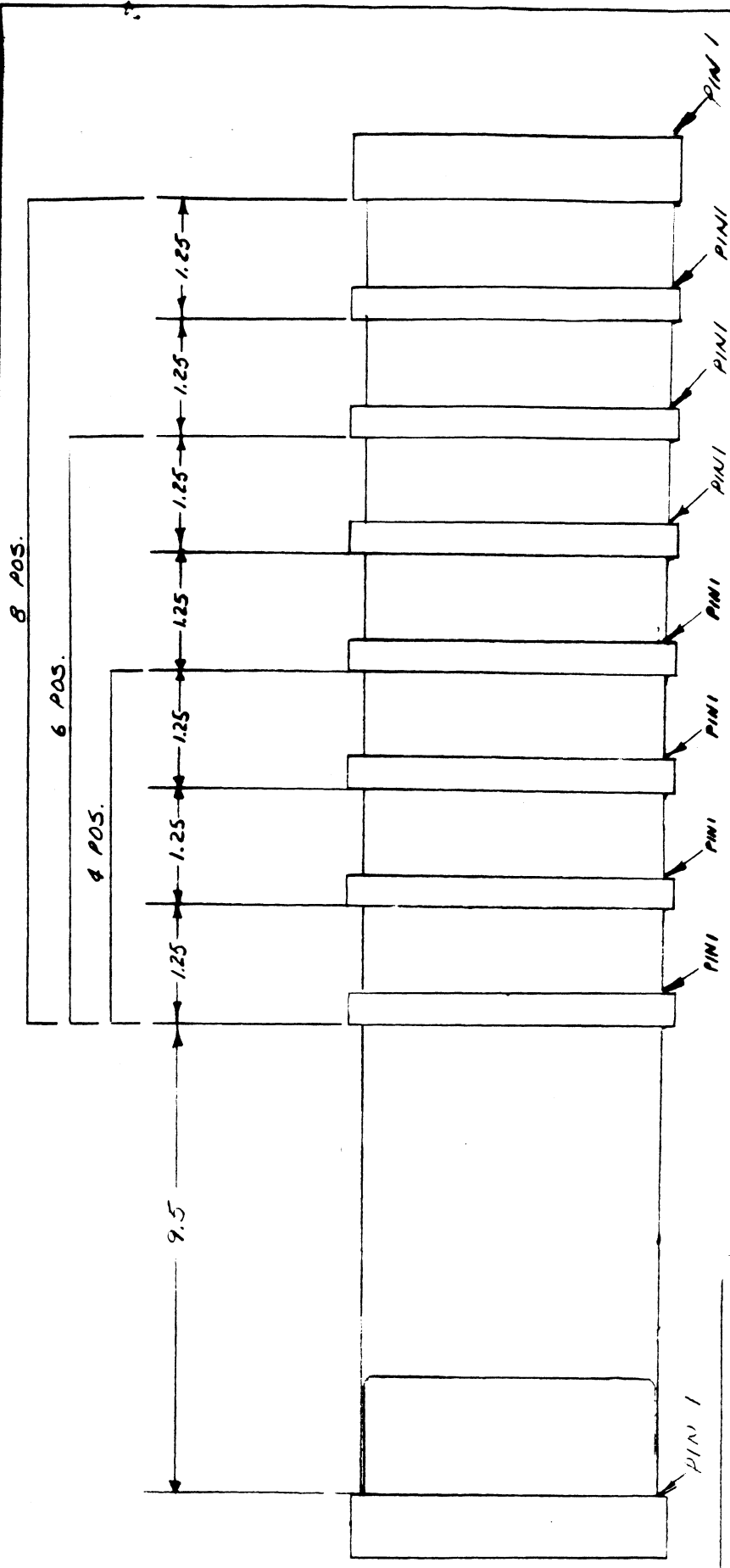
TITLE

INTERNAL DISK B FCC CABLE ASSEMBLY

DOCUMENT NO. 300-014-00 thru 300-014-03

SHEET 2 OF 2

REV. E



OPTION TABLE

PART NO	REV	OPTION
300-038-00	A	4 POSITION
300-038-01	A	6 POSITION
300-038-02	A	8 POSITION

REVISION HISTORY	
ECO #	DATE DESCRIPTION
0446	2-21-85 PER ECO

© 1985	ZETACO
DRAWN BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
SCALE:	
TITLE	300 038 - TAB

SHEET (1 OF 1)

PLUG CABLE WITH APPROPRIATE PART NUMBER & LENGTH
 ± 50 TOLLNANCE ON CABLE LENGTH ± 50

PARTS LIST
ZETACO

FOR: BMX BUS CABLE ASSY 4 POSITION

ASSEMBLY #: 300-038-00
REV. LEVEL: A

ITEM	QTY	PART #	GENERIC DESCRIP.	DESCRIPTION	REFERENCE
1	5	025-038-00	CONN F	3M 3417-6040	
2	5	030-033-00	CONN HDWE	3M 3490-4 PULL TAB	
3	0	020-015-00	CABLE	3M 3302/40 28 AWG	
4	1	099-010-00	LABEL	1/2" X 1 3/4" WHITE PAPER	
5	0	010-001-00	TAPE	3M 850 1"	

PARTS LIST
ZETACO

OR: BMX-3 "A" PADDLEBOARD ASSEMBLY

ASSEMBLY #: 500-408-00
REV. LEVEL: C

ITEM	QTY	PART #	GENERIC DESCRIP.	DESCRIPTION	REFERENCE
-----	---	-----	-----	-----	-----
1	4	026-008-00	CONN M	HDR 26P 3M #3593-5002	
2	2	025-035-00	CONN F	BERG 67659-066 24S EDGE	
3	5	099-004-00	LABEL	5552 AVERY	PORT 0,1,2,3
4	1	041-087-00	PCB PADDLE	BMX-3 "A" REV B	
5	2	070-038-00	PCB HDWE	ARIES 6-680-190T HEADER	
6	2	070-039-00	PCB HDWE	ARIES 6-655-10 COVER	
7	1	025-036-00	CONN F	BERG 67659-078 52S EDGE	

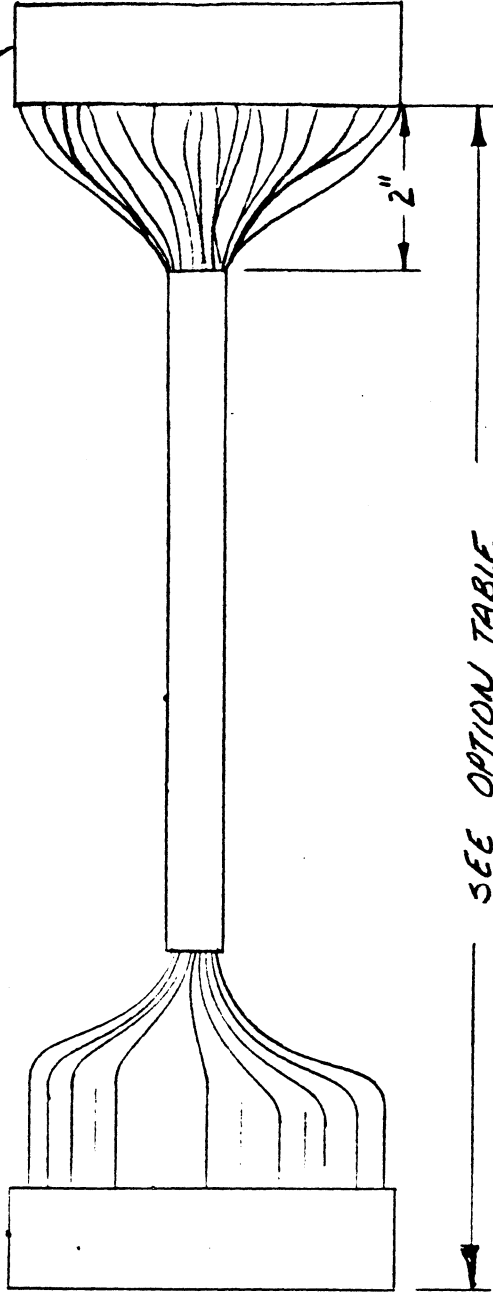
PARTS LIST
ZETACO

FOR: BMX-3 "B" PADDLEBOARD ASSEMBLY

ASSEMBLY #: 500-409-00
REV. LEVEL: D

ITEM	QTY	PART #	GENERIC DESCRIP.	DESCRIPTION	REFERENCE
----	----	-----	-----	-----	-----
1	4	051-039-00	RES 470	1/4W 5%	R1,R2,R3,R4
2	1	026-002-00	CONN M	HDR 60P 3M #3372-5002	P1
3	2	099-004-00	LABEL	5552 AVERY	SMD A, ASSY #
4	3	065-007-00	SOC LO PRO	DILB 14P-108T	U2,U3,U4
5	1	065-000-00	SOC LO PRO	DILB 8P-108T	U1
6	1	070-018-00	PCB HDWE	ARIES 10-680-191T HEADER	U2
7	1	070-012-00	PCB HDWE	ARIES 24-680-190T HEADER	U1
8	1	070-013-00	PCB HDWE	ARIES 24-655-10 COVER	U1
9	1	041-088-00	PCB PADDLE	BMX-3 "B" REV B	
10	1	065-001-00	SOC LO PRO	DILB 16P-108T	U1
11	6	070-007-00	PCB HDWE	.025X.025 W/W 86090-4 PIN	
12	2	070-037-00	PCB HDWE	ARIES ML-100S JUMPER	W2,W4
13	1	070-011-00	PCB HDWE	ARIES 10-655-10 COVER	U2
14	1	099-014-00	LABEL	BISHOP A 100-L ARROW	U1
15	2	025-035-00	CONN F	BERG 67659-066 24S EDGE	
16	1	025-036-00	CONN F	BERG 67659-078 52S EDGE	

PIN 1 TO PIN 1



SEE OPTION TABLE

(SHEET 1 OF 2)

REVISION HISTORY		DESCRIPTION
ECO	DATE	
0299	5/3/84	PER ECO
0445	2-7-85	ADD 10' LENGTH

OPTION TABLE		
PART NO	REV	OPTION
300-081-00	A	6'
300-081-01	A	16'
300-081-02	A	10'

NOTE: STAMP CABLE WITH APPROPRIATE PART NUMBER AND LENGTH

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DRAWN BY MILKETH	DATE 9-28-82	REVISIONS	DATE
CHECKED BY			
APPROVED BY			
SCALE: <i>R</i>			
TITLE DAISY CHAIN		DRAWING NUMBER	
"A" CABLE ASSY (FCC)		300-081-TAB	

PARTS LIST
ZETACO

FOR: DAISY CHAIN A CABLE ASSY FCC 6'

ASSEMBLY #: 300-081-00
REV. LEVEL: A

ITEM	QTY	PART #	GENERIC DESCRIP.	DESCRIPTION	REFERENCE
----	----	-----	-----	-----	-----
1	2	025-041-00	CONN F	3M 3334-6060	
2	2	030-034-00	CONN HDWE	3M 3490-5 PULL TAB	
3	0	020-016-00	CABLE	REX T-7978-30PR, 28 AWG	
4	1	099-011-00	LABEL	SLSH-20375 BRADY RND CBL	

