FAX

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DATE: March 19, 1997

TO: Matt Ruck

FAX#: 301 921-8775

FROM: Cheryl Y.

SUBJECT: BMX-2

These are pages from Q.A. RMA Notebook, I will send you the notebook later, I want to make some copies for myself.

Looking up on the 500-496-00 D parts list for BMX-2 Megatape: the part # 100-169-00 A IC Z80APIO is called out (also socketed) in loc. H4.

# of pages (including header page): 15

If you do not receive all of this transmission, please contact Braemar at 612-890-5135

Remove Rework steps 1-15;

ECO 0935
PAGE 3 OF 11

1. LIFT PIN 10 OF P1
2. ADD 74LS74 TO SPARE LOCATION K4 (pin 1 to pin 1)
3. WIRE P2-1 TO P2-2
4. WIRE P2-2 TO L2-2
5. WIRE P2-13 TO K2-1
6. WIRE P2-12 TO K4-2
7. WIRE K4-3 TO K2-6
8. WIRE K4-4 TO K6-6
9. WIRE K4-5 TO A4-8
10. WIRE A4-9 TO H1-5
11. WIRE K4-1 TO H2-10
12. WIRE A4-10 TO L4-12
13. WIRE L4-11 TO L4-9 TO K6-4
14. WIRE L4-13 TO K6-5 TO L5-6
15. ADD A 390 PF CAP BETWEEN L4-15 AND L4-14
16. ADD A 33K RESISTOR BETWEEN L4-14 AND L4-16
17. WIRE L4-10 TO LIFTED PIN 10 OF P1
18. WIRE K4-7 TO K5-7

Remove REGISTERS H-18

REWORK
ZETACO

FOR: BMX-2/SI ASSEMBLY #: 500-387-04A

ECO REWORK 0546,0602,0634,0688,0776,0995

BMX-2/SI REWORK FOR BOARD BLANK NUMBER 041-065-00

1. Lift pin at S2-6.
546 2. Add wire from S2-8 to S2-6 pad (not lifted pin).
3. Lift J11-6.
602 4. Add wire J11-6 to G9-3.
5. Cut and lift pin at IC A3-3.
6. Add wire from IC A4-2 to A4-3.
634 7. Add wire from IC A4-13 to IC A4-2.
8. Add wire form IC A4-1 to lifted pin of A3-3.
9. Lift R8-4.
10. Add wire form L2-3 to R8-4.
11. Add wire from K1-12 to L2-2.
688 12. Add wire form J1-4 to L2-1.
13. Lift pin F1-6.
14. Wire adds.
776 A) Z3-9 to F1-6. (Lifted pin)
B) Z3-10 to L4-3.
C) Z3-8 to F2-5.
15. Lift pin 2 of Z3.
16. Wire X4-3 to lifted pin Z3-2.
995 17. Wire Z4-8 to X4-2.
18. Wire Z4-12 to X4-1. 19. Remove ECO 935 if necessary
~~19. The above rework is for assembly # 500-387-04A.~~ Mark Bd
20. Install Eprom P10507.

NOTE: Remember to replace item 103 200-056-00 eprom set with 200-171-00 same position.

QA
~~21. Use silver label 500-387-04A~~

1. change L5 from CS04 to F04
2. Lift Z3-13.
3. Add wire to Y4-2 to Y4-3.
4. Add wire Y4-1 to pad of Z3-13.
5 Add wire Y4-4 to Z3-13 lifted pin
6. ASM= 500-387-04B

1. Lift N10-6
2. Add wires from/to
3. M8-13 to P7-12
4. M8-12 to Lifted pin N10-6
5 M8-11 to N9-4

500-387-04C

BMX-2 MEGATAPE OPTION REV'S FOR ARTWORK 041-116-00 B
ASM 500-0504-00

ECO	ASM. REV.	REASON FOR CHANGE:
----	500-0504-00 A 400-387-00 K 600-387-01 H	RELEASE OF THE BMX-2 MEGATAPE OPTION DIAGNOSTIC TAPE BMX-2 MANUAL THE BMX-2 REV. "B" ARTWORK HAD SOME RE-ROLL ERRORS. THE FOLLOWING REWORK & CHANGES WERE MADE. LIFT Y4-9. ADD WIRE FROM Y4-9 TO T4-12. CHANGE RESISTOR ON PRINT & PARTS LIST: R22-1 @ N10 FROM A 6.8K RESISTOR TO A 8.25K RESISTOR. NOTE ALL REV. "B" ARTWORK BOARDS RECEIVED THIS REWORK.
1861	CLASS B1 400-387-00 L	CORRECT BOOT PROBLEM ON MV30000. UPDATE TAPE FROM 400-387-00 K TO L. NOTE: NO BOARDS @ REV. "B" ARTWORK EVER RECEIVED A REV. K TAPE.
1902	CLASS B1 500-0504-00 B	HIGH MARGIN NOISE PROBLEM CAUSING INTERMITTANT ENDING ADDRESS ERRORS. ADD REWORK: (2) 180 OHM RESISTORS 1 FROM A9-13 TO A9-14. 1 FROM N8-14 TO P8-1. (2) 220 OHM RESISTORS 1 FROM A9-13 TO B9-7. 1 FROM P8-1 TO P8-7.
1963	CLASS B2 500-0504-00 C	ALLOW CHECKOUT TO CHANGE THE VALUE OF R22-1 IN THE RAM WRITE ENABLE CIRCUITRY AS NEEDED TO MEET 1 SHOT CIRCUIT REQUIREMENTS. NOTE THE 6.8K RESISTOR WILL BE THE VALUE INSTALLED BY PRODUCTION. THE OTHER OPTIONS ARE: 5.6K, 7.5K 8.25K OR 8.2K. R22-1 IS LOCATED LEFT OF P-10.

BMX-2 REV'S FOR ARTWORK 041-116-00 B
ASM 500-0503-00 (STANDARD BMX-2)

JO	ASM. REV.	REASON FOR CHANGE:
----	500-0503-00 A 400-387-00 K 600-387-01 H	RELEASE OF THE BMX-2 041-116-00 REV. B ARTWORK. DIAGNOSTIC TAPE BMX-2 MANUAL THE BMX-2 REV. "B" ARTWORK HAD SOME RE-ROLL ERRORS. THE FOLLOWING REWORK & CHANGES WERE MADE. LIFT Y4-9. ADD WIRE FROM Y4-9 TO T4-12. CHANGE RESISTOR ON PRINT & PARTS LIST: R22-1 @ N10 FROM A 6.8K RESISTOR TO A 8.25K RESISTOR. NOTE ALL REV. "B" ARTWORK BOARDS RECEIVED THIS REWORK.
1861	CLASS B1 400-387-00 L	CORRECT BOOT PROBLEM ON MV30000. UPDATE TAPE FROM 400-387-00 K TO L. NOTE: NO BOARDS @ REV. "B" ARTWORK EVER RECEIVED A REV. K TAPE.
1902	CLASS B1 500-0503-00 B	HIGH MARGIN NOISE PROBLEM CAUSING INTERMITTANT ENDING ADDRESS ERRORS. ADD REWORK: (2) 180 OHM RESISTORS 1 FROM A9-13 TO A9-14. 1 FROM N8-14 TO P8-1. (2) 220 OHM RESISTORS 1 FROM A9-13 TO B9-7. 1 FROM P8-1 TO P8-7.
1963	CLASS B2 500-0503-00 C	ALLOW CHECKOUT TO CHANGE THE VALUE OF R22-1 IN THE RAM WRITE ENABLE CIRCUITRY AS NEEDED TO MEET 1 SHOT CIRCUIT REQUIREMENTS. NOTE THE 6.8K RESISTOR WILL BE THE VALUE INSTALLED BY PRODUCTION. THE OTHER OPTIONS ARE: 5.6K, 7.5K 8.25K OR 8.2K. R22-1 IS LOCATED LEFT OF P-10.

BMX-2 500-496-00 ASM
041-116-00 A ARTWork

500-496-00 A: When released it should have on it ECO's 1154: 1372 in order to be @ Rev A.

500-496-00 B: Install New style stiffeers ECO1489

500-496-00 C: Instal ECO 1609

500-496-00 = Megatape Option
EPROM Label = P30200
Checksum = 08C8

BMX-2 REV'S FOR ARTWORK 041-116-00(A)

ECO	ASM. REV.	REASON FOR CHANGE:
	500-457-00 A	RELEASE FOR THE BMX-2 (PADS ONLY).
---	400-387-00 F	DIAGNOSTIC TAPE
	600-387-01 D	BMX-2 MANUAL
	CLASS C	ADD KENNEDY 9610 TAPE DRIVE TO THE CONFIGURATOR.
1061	400-387-00 G	UPDATE TAPE FROM 400-387-00 D TO G.
	CLASS C	
1084	500-457-00 B	FIX PRINT AND PARTS LIST.
	CLASS C	ADD TO THE APPENDIX DG/UX SUPPORT FOR THE BMX-2.
1136	600-387-01 E	UPDATE MANUAL FROM 600-387-01 D TO E.
	CLASS A2	CORRECT A CIRCUIT WHICH CAN CAUSE A GLITCH TO BE OUTPUT BY THE I/O DECODER-COULD CAUSE MANY ERRORS BUT SO FAR HAS ONLY CAUSED SPACING ERRORS @ HIGH MARGINS DURING RELI TESTING. ADD REWORK: REPLACE 74LS04 WITH A 74F04 @ L5.LIFT Z3-4.ADD WIRE FROM/TO Z3-4 TO Y4-10, Y4-8 TO Y4-11, Y4-9 TO FLOWTHRU
1154	500-457-00 C	HOLE FROM Z3-4. NOTE THIS WAS DEV. 81
	CLASS C	MANUAL: ADD QUESTIONS C. & D. ON PAGE 3-7. TAPE: ADD 2ND IOC SUPPORT IN RELI PROGRAM.
	600-387-01 F	UPDATE MANUAL FROM 600-387-01 E TO F.
1303	400-387-00 H	UPDATE TAPE FROM 400-387-00 G TO H.
	CLASS D	REMOVE PACKING LIST INFORMATION ON PAGE 2-1.
1347	600-387-01 G	UPDATE MANUAL FROM 600-387-01 F TO G.
✓	CLASS A2	CORRECT HARDWARE UNDETECTED DATA ERRORS DURING RUNNING OF LOW MARGIN RELI. ADD REWORK: LIFT N10-8. ADD WIRES FROM/TO:
1372	500-457-00 D	N10-13 TO P7-6. N10-12 TO N10-8. N10-11 TO N9-4.
	CLASS C	FOR A BETTER FITTING COVER, CHANGE STIFFENER FROM
1489	500-457-00 E	070-051-00 TO 070-069-00. CHANGE ASM REV. TO 500-457-00 E.
J	CLASS B1	FIX PARITY ERRORS ON THE LAST WORD TRANSFERRED OVER THE BMC BUS ON THE MV9500.ADD REWORK TO FIX PROBLEM ON 041-116-00 A ARTWORK ONLY, OLDER ARTWORK WILL NOT GET THIS FIX. ADD REWORK STEPS: LIFT F9-10. ADD WIRES FROM/TO: G9-10 TO W10-12. G9-9 TO W10-11. W10-10 TO W10-14. W10-13
1609	500-457-00 F	TO G9-6. W10-9 TO LIFTED PIN F9-10.
	CLASS C	PROVIDE SUPPORT OF UP TO 4 I/O CONTROLLERS OR DEVICE CODES 20-276 OCTAL WHEN USING THE CONFIGURATOR, RELI & DISK
1677	400-387-00 J	INITIALIZER PROGRAMS. UPDATE TAPE 400-387-00H TO J.
	CLASS C	ADD TELEX 9271 AS A SUPPORTED DRIVE IN THE CONFIGURATOR
	600-387-01 H	PROGRAM & IN THE TECHNICAL MANUAL. UPDATE TAPE 400-387-00J
1699	400-387-00 K	TO K. UPDATE MANUAL FROM 600-387-01G TO H.
	CLASS C	ARTWORK & ASM. ARE NOW OBSOLETE. START USING 041-116-00 B AND 500-0503-00 A. BUMP ASM. REV. FROM 500-457-00H TO G
1788	500-457-00 G	HOWEVER DO NOT MARK ANY BOARD WITH REV. G, MARK THEM REV.F.
	CLASS B1	CORRECT BOOT PROBLEM ON MV30000. UPDATE TAPE FROM
1861	400-387-00 L	400-387-00 K TO L.

Install any missing keyways

Integration Guide

Revision History

Rev.	Description	Engineering	Marketing	C. Support
A	RELEASE	RR	GB	TL
B	Add MV/40000 to Sec A	RR	GB	TL
C	Add AOS/VS II	RR	GB	CD
D	Add AOS/VS II Rev 2 & MV/950	RR	GB	CD
E	Typo	RR	GB	CD
F	Add Telex 9271 Delete DG/UX	RR	GB	CD

Model: BMX-2 ***Part Number:*** 940-001-00 ***Rev:*** F

Integration Guide

BMX-2 Tape Coupler

BMX-2 Tape Coupler has been tested and verified by Engineering for use with the following tape drives and Data General CPUs.

SECTION A: DATA GENERAL PROCESSORS

BUS STRUCTURE & DRIVER/EMULATION:

CPU MODEL	DCH 6026/MTX	DCH 6026/MTB	BMC (MTD) 6300/4307
NOVA 3	RDOS (7.0 to 7.5)	N/A	N/A
NOVA 4	RDOS (7.0 to 7.5)	N/A	N/A
S/120	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/140	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/280	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
M/600	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
C/150	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/130	RDSO (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
MV/4000	N/A	AOS/VS (5.0 to 7.67)	AOS/VS (5.0 to 7.67) AOS/VS II (2.02)
MV/6000	N/A	AOS/VS (5.0 to 7.67)	AOS/VS (5.0 to 7.67) AOS/VS II (2.02)
MV/7800C,U	N/A	AOS/VS (6.06 OR 7.67)	AOS/VS (6.06 OR 7.67) AOS/VS II (2.02)

....continued

pertech Interface Devices

ZETACO

MV/7800XP	N/A	AOS/VS (7.57 to 7.67)	AOS/VS (7.57 to 7.67) AOS/VS II (2.02)
MV/8000II,C	N/A	AOS/VS (5.0 to 7.67)	AOS/VS (5.0 to 7.67) AOS/VS II (2.02)
MV/10000	N/A	AOS/VS (5.0 to 7.67)	AOS/VS (5.0 to 7.67) AOS/VS II (2.02)
MV/15000	N/A	AOS/VS (7.55 to 7.67)	AOS/VS (7.55 to 7.67) AOS/VS II (2.02)
MV/20000	N/A	AOS/VS (6.54 OR 7.67)	AOS/VS (6.54 OR 7.67) AOS/VS II (2.02)
MV/40000*	NA 5000-457-00 F+ or 5000-0503-00 any rev.	AOS/VS (7.67)	AOS/VS (7.67) AOS/VS II (2.02)
MV/9500	N/A	AOS/VS (7.67)	AOS/VS (7.67) AOS/VS II (2.02)

* MV/40000 CPU requires BMX-2A, which comes with an MV/40000 cable harness.

BMX-2 Features Summary

- Supports data transfer rates up to 2*MB*/second
- Tri-density select may be done on the tape drive, or remotely from the console. If selected from the console, any two of the three may be chosen under AOS or AOS/VS. Note that RDOS does not support remote density select.
- Plug-compatible with FCC-hardened and non-FCC chassis
- Interfaces either the BMC or DCH

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Revision Compatibility/ECO Reference Chart

Model X Software Support Package Tape
400-496-00

DE-MED Model X Assembly 500-~~492~~-00 OSLS	~~A~~ C	H	J	K	L						ECO #	Class	Note
A	X	X	X		X								1
B	X	X	X		X						1302	131	2
Microcode revision													
ECO #	1 4 6 1	1 3 4 3	1 1 6 7 7		1 1 8 6 1								
Class													
Note	3	4	5		6								

Revision Compatibility/ECO Reference Chart

Model X Software Support Package Tape
400-~~4~~-00 387

Model X Assembly 500-~~4~~-00	~~A~~ F	H	J	K	L						ECO #	Class	Note
A	X	X	X		X								1
B	X	X	X		X						1942	B1	2
C (current)	X	X	X		X						1963	B2	7
Microcode revision					1.5.61								
ECO #	1C61	1396	1677		1602								
Class					B1								
Note	3	4	5		6								

500-503-00X uses artwork 041-116-00B

Revision Compatibility/ECO Reference Chart

BMX-2 ~~Model X~~ Software Support Package Tape
400-~~4[redacted]~~-00 387

BMX-2 ~~Model X~~ Assembly 500-~~4[redacted]~~-00 387	A	B V	C	D							ECO #	Class	Note
A	X	X									0412		1
B	X	X											
C	X	X									0504		2
D	X	X									0546		3
E			X								0547		4
F				X							0574		5
G				X							0581		6
G				X							0602		7
H				X							1634		8
J				X							1640		9
K				X							0641		10
Microcode revision													
ECO #		0463	0547	0455									
Class													
Note		30	31	5									

Revision Compatibility/ECO Reference Chart

BMX-2

~~Model~~ X Software Support Package Tape
400-~~496~~-00 387

~~Model X~~ Assembly 500-~~492~~-00 387	~~A~~ D	E	F	G	H	I	K	L			ECO #	Class	Note
~~A~~ L	X										0654		11
M	X										0675		12
N	X										0683		13
P	X										0688		14
R	X										0699		15
S	X										0714		16
T		X	X	X	X	X	X	X			0723		17
U		X	X	X	X	X	X	X			0760		18
W		X	X	X	X	X	X	X			0776		19
W		X	X	X	X	X	X	X			0792		20
X		X	X	X	X	X	X	X			0934		21
Microcode revision													
ECO #	0570	0723	0760	1061	1303			1681					
Class													
Note	5	17	18	28	29	31	31	32					

Revision Compatibility/ECO Reference Chart

BMX-2

~~Model X~~ Software Support Package Tape
400-~~496~~-00 387

~~Model X~~ Assembly 500-~~492~~-00 387	~~A~~ E	F	G	H	J	K	L				ECO #	Class	Note
~~A~~ Y	X	X	X	X	X	X	X				0935		22
AA	X	X	X	X	X	X	X				0995		24
AB	X	X	X	X	X	X	X				1034		25
AC	X	X	X	X	X	X	X				0945		23
AD	X	X	X	X	X	X	X				1170		26
AE	X	X	X	X	X	X	X				1372		27
Microcode revision													
ECO #	0723	0760	1061	1303			1861						
Class													
Note	17	18	28	29	31	31	32						

Notes

1. Release new artwork. Eliminate rework on th prototype PCB.

2. Resistor change in power-on-clear circuit.

3. Hardware change to correct a data channel timing problem. Eliminates a potential loss of data integrity.

4. New EPROM. Incorporates features of 500-387-01 into 500-387-00 and obsoletes 500-387-01.

5. New EPROM. Corrected remote density select problem with the Kennedy 9600 tape drive. new tape -

6. New artwork. for new → Incorporates FIFO speed-up circuit, new power-on-clear circuit and the MV/10000/Zebra fix. Added 1 pertec status line for the STA-1.

7. Implement MV/10000/Zebra fix. Superceeds ECO 581 for new artwork.

8. Corrected a parity error problem associated with odd-character records.

9. New artwork. only FIFO speed-up circuitry. Added 1 pertec command line for the STA-1. Added jumpers.

10. Added optional resistors for power-on-clear circuit to the parts list.

11. Added Aviv board cover option.

12. Corrected parts list. Corrected a power fail circuit problem.

13. Change N7 & H8 from 74F74 to 74S74. Corrects ending memory address, odd-character record and data late errors.

14. Corrected a DIA status problem with the [illegible] 92185 in a Nova 4.

15. Corrected manual. New Zmtrl listing.

16. COrrected grounding problem on cables.

17. AddedSTC 2920, 2921, 2922 support to Configurator. Changed the DBY timer from 2 seconds to 4 seconds to accomodate Cipher's rev. 04 firmware.

18. Added Fujitsu 2436 support to Configurator. Changed manual for the Fujitsu 2436 and the STA-1/STA-2.

19. Fixed power-on-clear problem in the MV/7800 CPU.

20. Doc. change only. Made assembly revs match on related documents.

21. New EPROM. Corrected an MV/7800 PCOPY problem.

22. Fixed a rewind problem with AOS/VS rev. 6.00+ and daisy-chaned units. Voided by ECO 995. This is the "Dual drive rewind" problem.

23. Obsolete. Replaced by 500-457-00.

24. See note 22. This ECO changed the rework steps. New EPROM.

25. Made use of a new PAL as the old PAL ~~was~~ is no longer available.

26. Corrected spacing errors under reli at high margin.

27. Corrected a hardware undetected data error problem under reli at low margin.

28. Added Kennedy 9610 support to the Configurator.

29. Added 2nd IOC support to Reli. Updated manual.

30. Added support for more tape drives. Made software easier to use.

31. New software revs. Why... ?

32. ~~[illegible]~~ 424-387-04L tape. Modified the Bootstrap for [illegible] Compatibility.

~~Mega~~ tape 200-0253-00
P 30200

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Revision Compatibility/ECO Reference Chart

BMX-2

~~Model X~~ Software Support Package Tape
400-~~496~~-00 397

~~Model X~~ Assembly 500-~~492~~-00 457	~~A~~ G	~~B~~ H	~~C~~ J	~~D~~ K	~~E~~ L	~~F~~	~~G~~	~~H~~	~~J~~	~~K~~	ECO #	Class	Note
A	X	X	X	X	X								
B	X	X	X	X	X						1054		1
C	X	X	X	X	X						1154		2
D	X	X	X	X	X						1372		3
E	X	X	X	X	X						1489		4
F	X	X	X	X	X						1609		5
~~Microcode revision~~ ECO#	1061	1303	1677		1861								
~~ECO #~~		~~0465~~	~~0467~~	~~0570~~	~~0723~~	~~0760~~	~~1061~~	~~1~~					
Class													
Note	1 1	1 2	1 3	1 4	1 5	~~1~~	~~1~~						

MV9500 9600 applied

500-457-00 X uses
Artwork 041-116-00A

1 of 2

Notes

1. Corrected ~~partslist~~ parts list errors.
2. Corrected a ~~problem~~ Spacing errors at high margin under Reli problem.
3. Corrected hardware undetected data errors under low margin Reliability.

4, New stiffener bar. (Megatape Product has this at: 500-496-00C.)
5. Corrected a BMC parity circuit problem which caused failure in the MV/9500 (MV/9500 Compatability)
6. Configurator enhancements and additional drive support. 6026 RD05 emulation. Diag ? Reli enhancements -
7. New Contig ? Diag -
8. Added Kennedy 9600 to Configurator
9. Added STC 2920, 2921, 2922 ? Cipher 990 to Contig -
10. Added Fujitsu 2346/STA-2 to Configurator.
11. Added Kennedy 9610 " "
12. Added IOC1 Support to Reli -
13. Added IOC0-3 support to Configurator ? Reli -
14. ?
15. 400-387-00 L type. Modified the bootstrap for MV/8000 Compatability.

500-496-00 C also is mu/9500 compatible.

Revision Compatibility/ECO Reference Chart

Model X Software Support Package Tape
400-~~4[illegible]~~-00 3871

Model X Assembly 500-~~4[illegible]~~-00 3504	~~A~~ G	H	J	K	L						ECO #	Class	Note
A	X	X	X		X								1
B	X	X	X		X						1902	B1	2
C	X	X	X		X						1963	B2	7 (See Note 7 on Sheet 503)
Microcode revision													
ECO #	1 1 6 1	1 3 9 3	1 6 7 7		1 5 6 1								
Class					B 1								
Note	3	4	5		6								

544-4543-44

1 New Artwork. (041-116-00B)

2 Fixed an ending memory address error problem at high margin caused by noise on SYNCLK. This problem prevented shipment of rev A board. ✓

3 Added Kennedy 9614 to Configurator.

4. Added IOC1 Support to Reli

5. Added IOC4-3 Support to Configurator & Reli

6. Modified the bootstrap for mv/34444 Compatibility

7. Allow Checkout to change the value of R22-1 in the RAM write enable Circuitry as needed to meet 1 shot circuit requirements. 6.8k is default. Options are 5.6k, 7.5k, 8.2k R22-1 located left of P10.

500-0504-00

1. New Artwork.
2. Fixed an ending memory address error problem at high margin caused by noise on SYNCLK. This problem prevented shipment of rev. A boards.
3. Added Kennedy 9614 to Configurator.
4. Added IOC1 Support to Reli
5. Added IOC0-3 Support to Configurator & Reli
6. Modified the bootstrap for mv/30000 Compatibility

SDD-0503-00

1. New Artwork.
2. Fixed an ending memory address error problem at high margin caused by noise on S4MCLK. This problem prevented shipment of rev. A boards.
3. Added Kennedy 5614 to Configurator.
4. Added IOC1 Support to Reli
5. Added IOC0-5 Support to Configurator & Reli
6. Modified the bootstrap for mv/3000 Compatibility

Tech Tip

For product model: BMX-2
Author.....: Scott T. Bohler
Date.....: 5/22/90

Problem:

Any unexplainable problem that potentially relates to a BMC transfer.

Environment or conditions under which the problem occurrs:

BMX-2 installed in an MV/10000 when a D.G. Zebra controller is also installed in the system.

Solution:

Try removing jumper W28-1 and installing jumper W28-2. It looks like this will mask /ADDRESS ERROR from the BMC during buffer reads. Use of this jumper, as far as I have been able to determine, has never been officially tested or documented. Problem symptoms associated with this jumper have not been established or documented either. Use of this jumper is therefore a shotgun approach to solving an unexplainable problem.

SEE ECO's 581,602 & 604.

Storage Technology Corporation
2270 South 88th Street
Louisville, Colorado 80028-~~0001~~
(303) 673-5151

0237

FAX: 303-673-5019

StorageTek

September 25, 1990

D116 is the released version

Mr. Conrad Daleiden
Zetaco Incorporated
6850 Shady Oak Road
Eden Prairie, MN 55344

Dear Conrad,

Enclosed you will find a set of microcode labeled D082990.PX for the IFP100 card in the 2922 tape drive. I am sending this at the request of NPA systems in New York. This microcode contains the fix for the tape mark handling problem we encountered with the 2922 connected to the Zetaco BMX2 controller.

If you have any questions or concerns, please give me a call.

Regards,

Pam Baker

Pam Baker
OEM Tech Support
303-673-6831

SOFTWARE SUPPORT PACKAGE TAPE
ZETACO

FOR: BMX-2

ASSEMBLY #: 950-029-00
REV. LEVEL: B

1. TAPE GENERATION:

   A. Log on the system and then enter: TAPES

   B. Load tape drive with a blank tape with write ring, select density and put drive on-line.

   C. Enter M387"*" and the following will be displayed:

      This is tape 400-387-00 "*"

File names will display as they are dumped to tape. When all have been dumped, screen will display:

Tape 400-387-00 "*" complete.

D. Remove tape from drive; remove write ring from tape; label the tape as follows:

ZETACO
MODEL BMX-2
SUPPORT PACKAGE 400-387-00 "*"
800 OR 1600 BPI

E. To generate another tape, go back to Step B; otherwise type BYE.

2. PROGRAMS ON TAPE:

A. CFBMX2.SV - REV. 07.30
B. BMX2D.SV - REV. 04.00
C. ZMTRL.SV - REV. 02.30

3. LISTINGS TO ACCOMPANY TAPE:

A. BMX2D - REV. 04.00
B. ZMTRL - REV. 02.30

* Indicates Current Revision

^Z

3. LISTINGS TO ACCOMPANY TAPE:

A. BMX2D - REV. 04.00
B. ZMTRL - REV. 03.00

* Indicates Current Revision

OCT 1 8 1991

PRINTED: 10/17/91

SOFTWARE SUPPORT PACKAGE TAPE
ZETACO

FOR: BMX-2

ASSEMBLY #: 950-029-00
REV. LEVEL: E

1. TAPE GENERATION:

   A. Log on the system and then enter: TAPES

   B. Load tape drive with a blank tape with write ring, select density and put drive on-line.

   C. Enter M387"*" and the following will be displayed:

      This is tape 400-387-00 "*"

File names will display as they are dumped to tape. When all have bee dumped, screen will display:

Tape 400-387-00 "*" complete.

D. Remove tape from drive; remove write ring from tape; label the tap as follows:

ZETACO
MODEL BMX-2
SUPPORT PACKAGE 400-387-00 "*"
800 OR 1600 BPI

E. To generate another tape, go back to Step B; otherwise type BYE.

2. PROGRAMS ON TAPE:

   A. ZETABOOT0.SV - REV. 2.00
   B. ZETABOOT1.SV - REV 1.00
   C. CFBMX2.SV - REV. 7.40
   D. BMX2D.SV - REV. 4.00
   E. ZMTRL.SV - REV. 3.00

3. LISTINGS TO ACCOMPANY TAPE:

   A. BMX2D - REV. 04.00
   B. ZMTRL - REV. 03.00

* Indicates Current Revision

SOFTWARE SUPPORT PACKAGE TAPE
ZETACO

FOR: BMX-2

ASSEMBLY #: 950-029-00
REV. LEVEL: D

1. TAPE GENERATION:

   A. Log on the system and then enter: TAPES

   B. Load tape drive with a blank tape with write ring, select density and put drive on-line.

   C. Enter M387"*" and the following will be displayed:

      This is tape 400-387-00 "*"

File names will display as they are dumped to tape. When all have been dumped, screen will display:

Tape 400-387-00 "*" complete.

D. Remove tape from drive; remove write ring from tape; label the tape as follows:

ZETACO
MODEL BMX-2
SUPPORT PACKAGE 400-387-00 "*"
800 OR 1600 BPI

E. To generate another tape, go back to Step B; otherwise type BYE.

2. PROGRAMS ON TAPE:

   A. CFBMX2.SV - REV. 07.40
   B. BMX2D.SV - REV. 04.00
   C. ZMTRL.SV - REV. 03.00

SOFTWARE SUPPORT PACKAGE TAPE
ZETACO

FOR: BMX-2

ASSEMBLY #: 950-029-00
REV. LEVEL: C

1. TAPE GENERATION:

   A. Log on the system and then enter: TAPES

   B. Load tape drive with a blank tape with write ring, select density and put drive on-line.

   C. Enter M387"*" and the following will be displayed:

      This is tape 400-387-00 "*"

File names will display as they are dumped to tape. When all have been dumped, screen will display:

Tape 400-387-00 "*" complete.

D. Remove tape from drive; remove write ring from tape; label the tape as follows:

ZETACO
MODEL BMX-2
SUPPORT PACKAGE 400-387-00 "*"
800 OR 1600 BPI

E. To generate another tape, go back to Step B; otherwise type BYE.

2. PROGRAMS ON TAPE:

   A. CFBMX2.SV - REV. 07.30
   B. BMX2D.SV - REV. 04.00
   C. ZMTRL.SV - REV. 03.00

****
****
* **TECH TIP 082** *
****
****
Catagory::Tape Product::BMX-2/GT-88
Reference::Configuration/testing
Submitted by::Robert Shaffer Date::October 28, 1992
****
UPDATED August 29,1994

The following is the setup and testing procedures when setting up a BMX-2 to run a GT-88 on a RDOS system.

BMX-2 CONFIGURATION
Tape Drive = M1 MT500//F880-1 **
Emulation = 6026 AOS, Read Look Ahead ENABLED!
See Tech Tip 010 for failures if not configured this way

GT-88 CONFIGURATION

	1	2	3	4	5	6	7	8
SW-1 (right side facing back)	U	U	U	U	D	U	U	U
SW-2 (left side facing back)	U	D	U	D	U	U	U	D

SW-1 and SW-2 are located on the back if GT-88 on the bottom left and right sides.

RELIABILITY
When MAG TAPE RELI is loaded from the BMX-2 tape, it will ask you to choose from 5 different emulations. You MUST choose the 6021 emulation even though the controller is configured for 6026 AOS. If any other emulation is choosen, then it will fail with DIA status errors!

DIAGNOSTICS
The MAG TAPE DIAG should run clean configured with a 6026 AOS emulation.

** F880-1 is the ONLY emulation that will run RELI and DIAG with the NEWER BMX-2 PROM sets!! Answer NO to variable gap, high speed, and high speed file search.

Revisions of RELI tested were 1 and 3, DIAG rev was 4.

Notes:
1) Make sure the 8mm tape heads are clean! This is very important, this subsystem and RDOS don't like hard errors!
2) The above configuration was tested on a S280, DCH.
3) RDOS 7.50 was used for the testing, FDUMP, FLOAD, BURST, and BURST VERIFY ran clean.

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****
* **TECH TIP 123** *
****
****
Catagory::Controller Product::BMX-2
Reference::Part numbers and rev history
Submitted by::Robert Shaffer Date::Aug 2, 1994
****

The BMX-2 has many part numbers. They are as follows with some history.

500-387-00 OBSOLETE replaced by 500-457-00A
will not work in any fast MV's
last known rev was AJ

500-457-00 replaced by 500-0503-00A
F - BMC sync fix to run on MV/9500 and above
last rev of this board

500-0503-00 A - replaced 500-547-00F
B - current rev
fixed sync clock problems causing Ending Memory Address Errors on noisy BMC busses

500-546-00 A - original release for Megatape support
same as 500-457-00 except Prom and strap changes
C - current revision
artwork same as 500-457-00F

****
****
* **TECH TIP 120** *
****
****
Catagory::Controllers Product::BMX-2
Reference::Upgrade from 500-457-00F to 500-496-00C
Submitted by:: Robert Shaffer Date::May 27, 1994
****

This upgrade is to properly use a 8mm Megatape tape drive on the BMX-2. It changes the part number of the BMX-2 from 500-457-00F to 500-496-00C. The artwork of the BMX-2 is the same.

To upgrade do the following:
- change eeprom @ 4P from P10507 to P30200 (blank=2732A-20)

- change processor @ 4H from Zilog Z0842004PSC to Mostek MK3881N-4 both are Z80 PIO chips

- change jumper @ 11X/Y. remove W24-2 and install W24-1

That is all that is needed.

Integration Guide

BMX-2 Tape Coupler

BMX-2 Tape Coupler has been tested and verified by Engineering for use with the following tape drives and Data General CPUs.

SECTION A: DATA GENERAL PROCESSORS

BUS STRUCTURE & DRIVER/EMULATION:

CPU MODEL	DCH 6026/MTX	DCH 6026/MTB	BMC (MTD) 6300/4307
NOVA 3	RDOS (7.0 to 7.5)	N/A	N/A
NOVA 4	RDOS (7.0 to 7.5)	N/A	N/A
S/120	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/140	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/280	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
M/600	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
C/150	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/130	RDSO (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
MV/4000	N/A	AOS/VS (5.0 to 7.67)	AOS/VS (5.0 to 7.67) AOS/VS II (2.02)
MV/6000	N/A	AOS/VS (5.0 to 7.67)	AOS/VS (5.0 to 7.67) AOS/VS II (2.02)
MV/7800C,U	N/A	AOS/VS (6.06 OR 7.67)	AOS/VS (6.06 OR 7.67) AOS/VS II (2.02)

....continued

Integration Guide

BMX-2 Tape Coupler

BMX-2 Tape Coupler has been tested and verified by Engineering for use with the following tape drives and Data General CPUs.

SECTION A: DATA GENERAL PROCESSORS

BUS STRUCTURE & DRIVER/EMULATION:

CPU MODEL	DCH 6026/MTX	DCH 6026/MTB	BMC (MTD) 6300/4307
NOVA 3	RDOS (7.0 to 7.5)	N/A	N/A
NOVA 4	RDOS (7.0 to 7.5)	N/A	N/A
S/120	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/140	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/280	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
M/600	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
C/150	RDOS (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
S/130	RDSO (7.0 to 7.5)	AOS (6.0 to 7.0)	N/A
MV/4000	N/A	AOS/VS (5.0 to 7.6) DG/UX (4.01)	AOS/VS (5.0 to 7.65) DG/UX (4.01) AOS/VS II (2.00)
MV/6000	N/A	AOS/VS (5.0 to 7.6) DG/UX (4.01)	AOS/VS (5.0 to 7.65) DG/UX (4.01) AOS/VS II (2.00)
MV/7800C,U	N/A	AOS/VS (6.06 OR 7.6) DG/UX (4.01)	AOS/VS (6.06 OR 7.65) DG/UX (4.01) AOS/VS II (2.00)

....continued

SECTION B: VERIFIED TAPE DRIVES

LEGEND: SS = Start/Stop
S = Streamer
SS/S = Start/Stop & Streamer

DRIVE MODEL	800 bpi (NRZI)			1600 bpi (PE)			6250 bpi (GCR)		
	Type	IPS	KB/sec	Type	IPS	KB/sec	Type	IPS	KB/sec
Cipher F880				S	100	160			
CDC 92185-01				S	75	120	S	75	469
Fujitsu 2442				S	100	160	S	100	625
Fujitsu 2444				S	75	120	S	75	469
Fujitsu 2436				SS/S	200	320	SS/S	200	1250
Kennedy 9400	SS	75	60	SS	75	120	SS	45	281
Kennedy 9600	S	100	80	S	100	160			
Kennedy 9610	SS	50	40	SS	100	160	SS	100	625
STC 2921				SS	50	80	SS	50	312
STC 2922				SS/S	100	160	SS/S	100	625
Telex 9251	SS	50	40	SS	50	80	SS	50	312

Megatape MT500 *Streams at 180 ips (10,666 bpi), resulting in 250 KB/sec.*
Megatape MT750 *Streams at 180 ips (16,000 bpi), resulting in 250 KB/sec.*

SECTION C: OTHER DISK DRIVES

If you know of devices other than those listed in Section B that are running with BMX-2, please write or FAX our Customer Support Group with the information so they can be added to this section.

Cipher M990
STC-2925

ZETA

Tech Topics *No. 19, 3/91*

Controller Software Now Supports Multiple IOC's

The Software Support Tape for the most popular Zetaco products has been updated to include support for up to 4 IOC's (Input/Output Channels). The updated Controllers and Subsystems include:

SCZ-5 Disk/Tape Controller	*SKM Disk/Tape Subsystems*
SCZ-3.2 Disk Controller	*SKS-HP Disk Subsystems & SKR-600 Optical Subsystems*
SCZ-4 Tape Controller	*SKT Tape Subsystems*
BMX-2 Tape Coupler	(user integrated)

The hardware on these Controllers already supported multiple IOC's, but the software needed to be updated so that the installer could configure the 3rd and 4th IOC, and run reliability and other diagnostics. Note that there is no change to the hardware.

This enables expanded I/O capabilities. More IOC's provide more device codes, and thereby, more controllers per system, so that more peripherals can be supported.

If you would like an updated software tape for your installed controller or subsystem, please order from Customer Support by calling 1-800-537-5292. Part numbers are:

for SCZ-5	*400-497-00, rev E*	*$50*
for SCZ-3.2	*400-496-00, rev H*	*$50*
for SCZ-4	*400-484-00, rev F*	*$50*
for BMX-2	*400-387-00, rev J*	*$50*

BMC BUS CONTENTION

Replace INTERNAL etch with shorter WIRE RUN

BMX3

LIFT PIN ON N11-1 $\overline{\text{DATA}}$

LIFT PIN J1-33 $\overline{\text{DATA}}$

RUN WIRE:

N11-1 to J1-33

J1-33 to TERMINATOR B12-1 $\overline{\text{DATA}}$

BMX2 500-387-00 NOT 500-457-00

LIFT PIN J1-33 $\overline{\text{DATA}}$

LIFT PIN K11-1 $\overline{\text{DATA}}$

LIFT PIN L10-12 $\overline{\text{DATA}}$

RUN WIRE:

L10-12 to K11-1

K11-1 to TERMINATOR L11-1 $\overline{\text{DATA}}$

L11-1 to J1-33

BMX2 500-547-00

TURN OVER

BMX2 500-547-00

Lift J1-33

Lift L11-2

Lift K11-11

Lift L10-1

Run wire L10-1 to K11-11

Run wire K11-11 to L11-2 (terminator)

Run Wire L11-2 to J1-33

****
****
******** TECH TIP #23 ********
****
****

egory - Tape Product - BMX2

ference - Timeouts under AOS/VS

Submitted by - Robert Shaffer

****
****

I have noticed that from time to time BMX-2's will give a TIMEOUT under the operating system. The controller will run diagnostics and reli fine but will occasionally give the timeout when dumping to it.

CONFIGURATION

This problem occurs when the controller is configured for 4307 w/BMC and a streamer tape drive attached (STC2922, CDC 92185, etc).

PROBLEM

Timeouts under the operating system. Occurs more frequently when batching a job to the tape drive.

SOLUTION.

When a streamer tape drive is configured on the BMX-2, the configuration program will ask if you want AUTO RETRY (Y/N). The default is 'Y'. To stop the timeouts you MUST answer 'N' to this question. If you answer yes, the CONTROLLER (not the operating system) will do the following: do a rew or rev. and then go back to the area that the error occurred and the try a rewrite. This will work okay if you are close to the beginning of tape, but the further you are into the tape, the LONGER it takes to perform this function. Since software does not know whats going on, it gives a TIMEOUT if the process es to long!! (the software still thinks it issued a read/write command and will time out on that command).

NOTES.

Sometimes after stopping a job that gave a timeout, the next job will give a timeout also, even though there was no error. A FIX for this is to issue a REWIND to the tape drive prior to starting a new dump to it.

DPS-1 switches are also prone to timeouts. Sometimes turning the DPS switch and the tape drive off/on will clear the timeouts, othertimes you may need to bring down the system.

The results you get and the circumstances that the timeouts occur seems to differ with revisions of the operating system and the configuration of the tape subsystem hardware.

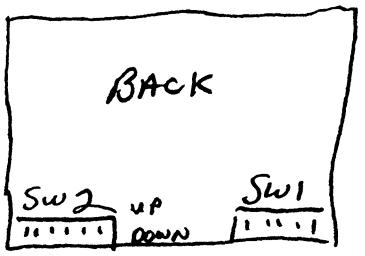
TECH TIP #10

CATAGORY - TAPE Product - GT88/1
Reference - Configuring Bmx2 w/GT88 to work w/ROOS

Problem :- GT88 will do FDUMP OKAY
- But FLOAD generates the following error:
- "Trailer Record does NOT match RecordCount"
- BURST won't verify
- Sometimes you get parity errors with LOAD COMMAND

FIX : Configure as follows.

DRIVE



SW1 = 1 2 3 4 5 6 7 8
U U U U D U U U

SW2 = 1 2 3 4 5 6 7 8
U D U D U U U D

U = Up D - down

Bmx2
MT 500
6026 AOS
READ Look Ahead enabled } MUST BE SET THIS WAY NO exceptions

Tech TOPICS

ZETACO

BMX-2 Unit Exchange Allows Operation with MV/9500's BMC

No. 16, 9/90

Situation: Although Zetaco's BMX-2 Tape Coupler functions properly on the DCH (Data Channel) bus in Data General's new MV/9500 minicomputer, it does not work when attached to the BMC (Burst Multiplexor Channel).

Solution: Zetaco has implemented an upgrade to the coupler that enables MV/9500 BMC operation; the upgrade is installable only at the factory. Zetaco now offers a **unit exchange program**, whereby customers can replace their existing BMX-2's for upgraded units. [Note that BMX-2 Tape Couplers, 500-457-00 rev F or later, have already been upgraded for MV/9500 BMC operation.] The replacement unit will operate in all CPU's listed in Zetaco's BMX-2 Integration Guide.

Unit Exchange Program: Upon the customer's request, Zetaco will ship an upgraded BMX-2 Tape Coupler, and invoice per the pricing schedule listed on the back of this page. The customer then has 10 days to remove the original BMX-2, return it to Zetaco, and install the new unit. If the original BMX-2 unit is not returned to Zetaco within 10 working days, the customer will be invoiced for the list price of the replacement unit, which is $2,995.

Deliverables: One BMX-2 Tape Coupler. Customer must retain the original paddleboards, cabling, Software Support Tape, and Technical Manual for use with the replacement unit.

over.....

6850 Shady Oak Road, Eden Prairie, Minnesota 55344 U.S.A. Telex 290975 FAX 612 941 1395 Phone (612) 941 9420

Distributor Update
Tech Tips No. 22, 7/87

ZETACO

SOLUTIONS TO PROBLEMS USING PCOPY WITH BMX-2

Two problems were discovered during PCOPY testing on DG's MV/7800 Series processor with Zetaco's BMX-2 Tape Coupler, under 6026 & 4307 emulation: (1) Labels are not written correctly, and (2) a sequence error occurs during the read/verify portion on the second reel.

Test equipment and results are outlined on the second page of this document, FYI.

ANALYSIS & SOLUTIONS:

1. Labeling Tapes

   Instead of writing the label data in the first two blocks, all zeros were written, resulting in a missing or invalid label error under the verify portion of PCOPY.

Solution:

   Data General has a patch for SYSBOOT, number 7.56.01, that will fix the problem. Contact your local DG supplier for the patch.

2. Sequence Errors

   On MV/7800 Series CPU's, a sequence error occurred on the second volume of tape during the read/verify portion of PCOPY. Note that it did NOT occur with the MV/15000.

Solution:

   Zetaco has implemented a change in BMX-2 firmware that eliminates this error. Units shipped after July 9 have the change.

PLEASE HELP US:

The MV/7800's have some differences in their architecture compared to other DG CPU models. Zetaco is making every attempt to be aware of the differences and to keep our customers fully informed.

If you have seen other situations that may need our investigative attention, please call Zetaco's Customer Support Hotline at 612-941-9480. Thank you!

BRIEF SUMMARY OF NEW FEATURES ON THE ARZ-1 (as of 7-1-87):

1. Data General has released Argus Dual Porting, and ARZ-1 now supports this new feature of the Argus driver.

2. ARZ-1 now uses Bit Cell Perimeter Analysis in mapping bad sectors on the disk surface. This means that not only is the location of the data bit tested, but four points surrounding it are, as well, to help avoid errors and maximize data integrity.

3. Performance has been substantially improved by our restructuring of the microcode and adding a new feature called Dynamic BMC Break. The microcode was rewritten to minimize the time needed for finding control blocks, so the controller can spend more time transferring data. Dynamic BMC Break continually and automatically adjusts the BMC break count based on bus traffic. Together, these two features result in about a 30% performance increase.

4. ARZ-1's Configurator Program has been updated to include parameters for two more high performance winchester drives:

   Control Data's new 9773 XMD-III is a 14" SMDE disk drive that provides 1174 formatted megabytes of storage capacity! That's 60% more than the 9772 XMD-II, and nearly double the capacity of a 592 Argus!

   Fujitsu's 2344 is an 8" disk that formats to 589 MB, has an HSMD interface, and a data transfer rate of 2.46 MB/sec. Combined with Zetaco's ARZ-1, it offers good competition for DG's 6239 Argus (592 MB).

NOTES ON THE TESTING

THE GREAT BUFFER DEBATE: It all goes back to the "streaming vs. start/stop" question. Buffered or cached drives were an attempt to keep streaming mechanics in motion in a start/stop environment.

During a WRITE command, if the host is feeding data at a rate faster than the drive can write, a buffer provides the holding tank from which data can be trickled at the drive's speed while accepting it at the host's faster rate. However, if the host is slower than the tape drive, having the buffer makes no difference, and the buffer is not needed.

HOW THE UTILITY AFFECTS PERFORMANCE: The degree to which a drive streams or starts & stops during operation is directly affected by whether the utility being used is run under the operating system in a 'stand-among' mode, or without the operating system in a 'stand-alone' mode.

With a stand-among utility, such as DUMP_II, write commands to tape are only part of the job performed. The utility must first (1) logically decide what is to be written, based on the template given in the command, (2) find enough memory for the block size specified in the command, and (3) place the data in memory.

This unalterable process takes time, and a subsystem that finishes each command quickly will idle, or stop, until the next instruction, when it can start again. For this reason, a tape drive will appear to 'stream' at 50 ips (because it isn't waiting for the next command), and seem to 'start/stop' at 100 ips (beacuse it must wait). Each mode takes the same amount of time to finish. Does adding a buffer make a difference? We found that it did not.

With a stand-alone back-up utility, such as PCOPY or COMMAND STRING under the Reliability Program, there is no logical overhead, so tape commands may be issued at a faster rate. This makes a faster drive operate more efficiently, possibly even to act like it is streaming.

HOW BLOCK SIZE AFFECTS BACK-UP: The larger the block size, the harder it is for the BMX-2 to secure contiguous sections of memory for the transfer -- hence, the operation takes longer. However, this also decreases the gap space, allowing physically more data per tape.

RESULTS EXPLANATIONS:

1) The performance of DG back-up utilities cannot be improved by enhancing the speed, density, or transfer rate of the tape drive.

2) In assessing back-up needs and solutions, consider the following conclusions drawn from our testing:

a. When using logical back-up, a high-speed, high-density tape drive (ie: 100 ips, 6250 bpi, streaming) will have periods of 'wait time' because it finishes each command at a faster rate, with less tape used, and must wait for the next command. (In our tests, at 50 ips, 6250 bpi, the tape had continuous motion; at 100 ips, 6250 bpi, it did not.)

b. With a logical back-up utility, such as DUMP or DUMP_II, specifying a larger block size in the command line reduced the number of gaps on the tape and increased the amount of data written on tape.... but also slowed the process because more memory was needed.

c. Using the Dynamic Gap feature of the BMX-2 to artificially extend the length of the inter-record gap maintained the motion of a high density, high speed drive, but the benefit of high density storage was significantly reduced because the gaps were longer, thereby reducing how much data was recorded on the tape.

d. Adding a buffer to the high speed, high density drive did nothing to prevent 'wait' states.

e. Physical back-ups (ie: PCOPY), which copy entire disks without regard to a user template, showed a marked improvement over logical back-up utilities in performance with high density, high speed drives.

3) The limitations described have nothing to do with the design of the tape coupler or the tape drive, and have everything to do with the speed of the mag tape drivers of the host and the back-up utility used.

4) Buffered tape drives, streaming tape drives, and high density tapes can operate with the BMX-2 Tape Coupler, but the overall drive configuration parameters may be different for each customer's requirements. The user should experiment by adjusting the drive configuration parameters (refer to the drive manual for details).

Zetaco's technical support of buffered tape drives is limited. Please refer to Section C of the BMX-2 Integration Guide.

EXTENDING THE GAP LENGTH WITH 'DYNAMIC GAP LENGTH SELECT': On the other hand, the Dynamic Gap Length Select feature on the BMX-2 allows the user to extend the gap space for a selectable period of time. Using this feature, a user can make a drive 'stream,' but the trade-off is that the amount of data written on the tape may be less than what's desired. This trade-off will have to be determined by each user, and what will best suit his/her application.

IS HIGH DENSITY TAPE (6250 bpi) DESIRABLE?: Although using 6250 bpi tape doesn't reduce the recording time on any kind of tape drive (whether streaming or start/stop, buffered or un-buffered), more data will fit onto the tape, so fewer reels of tape will be used. (If, however, Dynamic Gap is extended too far, the data density on the tape may be less than otherwise expected.)

TAPE SPEED: Due to the architecture of the DG processors, implementing higher speed tape drives (higher than 50 ips), makes little or no difference in time needed to copy a file or whole disk.

##

Distributor Update

Tech Tips No. 15, 12/85

ZETACO

BMX-2 Tape Coupler Interfaces the STC 2922 Tape Drive

Zetaco has completed integration evaluation of our BMX-2 Tape Coupler with **Storage Technology Corporation's Model 2922 Magnetic Tape Drive.** Tips for successful integration follow.

Model 2922 is a dual density tape drive, capable of recording and reading ANSI-compatible tape in Phase Encoded (PE) format at 1600 bpi, and Group Coded Recording (GCR) format at 6250 bpi. The 2922 has a tape speed of 50 ips start/stop and 100 ips streaming.

The 2922 allows remote density select (1600/6250 bpi) via the BMX-2 hardware and minicomputer software.

The 2922 does NOT support remote speed select or remote inter-record gap length select with the BMX-2 Coupler. These features must be selected via jumpers within the tape drive unit, or via the operator panel when in diagnostic mode.

The two options on tape speed are 50 ips start/stop, and 100 ips streaming. Options on selectable inter-record gap length are:

6250 bpi -- .3, .6, or .9 inches
1600 bpi -- .6, .9, or 1.2 inches

Reference the STC 29XX tape drive technical manuals for details of speed selection and selection of various inter-record gap lengths. Zetaco does not recommend a particular selection, but suggests 50 ips for daily usage, and 100 ips for file back-up. Start with the minimum gap size and extend it if excessive reposition cycles occur.

Because our evaluation and testing on this drive are only recently completed, the Configuration Program for the BMX-2 does not list the STC 2922. Follow the configuration steps for the STC 2921, which is in the Program. Two choices are available:

S3 -- Remote Density Select
S4 -- Manual Density Select

Either choice is acceptable.

##

Maximum Block Size (K Bytes)	9, 16, 24, 32, (64 optional)	32	32	32
Interface Ramp Delay	0 thru 15	0	0	0
File Mark Write Sync	yes or no	yes	yes	yes
Read Error Retries	0, 4, 8, 12, 16	16	16	16
Write Error Retries	0, 4, 8, 12, 16	16	16	16
Error Correction ON	yes or no	yes	yes	yes
Unit	0 thru 7	0	0	0
Lock Out 3200 bpi Writes	yes or no	no	no	no
Remote Density Select Enabled	yes or no	yes	no	no
High Speed Ramp Enabled	yes or no	no	no	no

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ZETACO

Data Loss with Multi-reel Utilities on CacheTape

When running Zetaco's TC-133 or BMX-2 Tape Couplers with Cipher's CacheTape drives, you may lose data when using multireel copy utilities such as FDUMP and PCOPY. This is because the CacheTape writes past End of Tape(EOT); data cannot always be recovered when more than one reel is required, because the system stops reading when it reaches EOT.

Single reel utilities, such as DUMP or DUMP II, do not have this problem.

BMX-2/CacheTape Combinations

The Remote Density Select feature on the BMX-2 Tape Coupler does not function with the Cipher CacheTape since there is no return of the density status lines.

Zetaco is working with Cipher on resolutions to these problems and we'll inform you of them as soon as we can.

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Distributor Update

Tech Tips No. 6, 4/85

ZETACO

THREE EMULATIONS AVAILABLE ON BMX-2 TAPE COUPLER

The BMX-2 Tape Coupler now also supports DG subsystem emulations under RDOS, as well as under AOS and AOS/VS. (How it is used is dependent on the DG operating system limitations.) Emulation choices, made via **ZETACO**'s Configurator Program on the BMX-2, include:

Subsystem	Description
1. 6300/4307	DG's 6250 bpi emulation for use with AOS/VS.
2. 6026 (AOS)	DG's 1600 bpi emulation for AOS and AOS/VS.
3. 6026 (RDOS)	A version of DG's 6026 emulation for use with RDOS.

Operating System	Emulation 6300/4307	6026/AOS	6026/RDOS
AOS/VS	Yes (BMC only)	Yes (DCH only)	No
AOS	No	Yes (DCH only)	No
RDOS (Rev 7.0 & above)	No	No	Yes (DCH only)
RDOS (Below Rev 7.0)	No	No	No

Notes:

1. The new emulation, 6026 (RDOS), is supported only on BMX-2 units with EPROM's with number P10502 or higher and **ZETACO**'s Configurator Program Rev 3.0 or higher. Older versions of BMX-2 may operate as a 6026 under RDOS, but these installations are not supported by **ZETACO**. If the customer requires RDOS support, ensure that he has the correct EPROM and Configurator Program Tape ($110 for upgrade). If he does not run 6026/RDOS, he does not need a new Configuator Program tape.

2. Under 6026 (AOS) (a true, 100% 6026 emulation), Remote Density Select and Fixed Density drives are all supported.

3. Under 6026 (RDOS), only drives that have Manual Density Select or a fixed density are supported. Remote Density Select is not supported by the operating system.

4. Do not run DG system level diagnostics with the 6026 RDOS emulation. Results are unpredictable and meaningless.

5. Neither the 6125 nor 6021 emulations are supported by the BMX-2. The BMX-2 enables start/stop and streaming drives to operate under the 6026 emulation. (6125 and 6021 are supported by **ZETACO**'s Model TC-133 Tape Coupler.)

6. The 6300/4307 driver is only available in the AOS/VS operating system and therefore can only be used with MV series computers. Although some Eclipse series computers have the Burst Multiplexor Channel (BMC), it is not accessible by any tape coupler. The BMC can only be used on MV series computers under AOS/VS operating system and the 6300/4307 emulation.