DICK BAILEY

RM 02 / 03

Problems and Hints

for differences see also * → about 15 pages from back.

MODULE DIFFERENCES BETWEEN RM02 AND RM03

Mdl Loc	RM02	diff.	RM03
A2A01	CLSV		CLSV
A2A03	HFRV	*	JFRV
A2A04	EKFV		EKFV
A2A05	LLRV	*	HLRV
A2A06	CLZV	*	BLZV
A2A07	JLQV		JLQV
A2A08	ELUV		ELUV
A2A09	FLPV		FLPV
A2 10	ASGV		ASGV
A2B01	JTVV	*	HTVV
A2B02	HRVV		HRVV
A2B06	FLWV		FLWV
A2B07	GLXV	*	ELXV
A2B08	NLTV	*	ELTV
A2B09	MLVV		MLVV
A3A01	HZYN		HZYN
A3A02	SZJN	*	NZJN
A3A03	DZKN		EZKN
A3A05	FZQN		FZQN

* different
7 are different

digital

INTEROFFICE MEMORANDUM

TO: Tech Tips

DATE: 14 MAR 78
FROM: Ben Sylvain
DEPT: R/GA/WP
EXT: 2697
LOC/MAIL STOP: NI/P40

SUBJ: RM03 HEAD ALIGNMENT

At the present time, we don't have a head alignment program for RM03. Here is a short program and direction. Install all equipment (C.E pack, A02 board, meter ..etc). Remove carriage locking pin before starting program. Load heads and make sure unit is Write Locked.

```
200/12737
202    23   Pack ackn. to set VV bit
204/176700
206/ 13737
210/177570   SR bit 8,9,10 for head select
212/176706
214/ 12737
216/   365   Cylinder 245
220/176734
222/ 12737
224/    71   Read data  (implied seek, selects head)
226/176700
230/000000   Halt
```

Check all heads including Servo.
Servo = + or - 30 mV
Heads = less than 100mV
If a head is misalign do a recalibrate and torque head to 5 in/lb

```
head 0
head 1
servo      LOCATION OF HEADS
head 2
head 3
head 4
```

WHEN ALIGNING HEADS MAKE SURE CARRIAGE IS LOCKED. BEFORE DOING A RECALIBRATE UNLOCK CARRIAGE.

```
232/ 12737
234/     ~~5~~   Clear //
236/176700
240/ 12737
242/     7   Recalibrate
244/176700
250/000000   Halt
252/   137   Jump back
254/   206
```

Hit continue twice and set up SR to select next head.
Final torque setting is 12½ in/ld.

82

The EQKC..... doesn't handle the RM03 subsystem. To be able to check the cache with the RM03 subsystem change the following locations :

Loc.	From	To
40100	17700	17600
40104	001466	631
40112	001466	631
40146	174340	170340
40160	2000	11000
40166	2000	11000
40202	37	25
40210	37	25

Change the linker configurator DZQVX... as follows, in order to be able to generate a X11 System on the RM03 :

Loc.	From	To
3400	041104	051104
3412	041104	051104
5762	041104	051104
5774	041104	051104
6006	041104	051104
6020	041104	051104
32716	26	40
32742	23	5
46020	26	40
46044	23	5

New DFC x11 handles OK

OFF THE TOP OF THE STACK

CAUTION:

THE DISK DRIVE SHOULD NOT BE OPERATED FOR EXTENDED PERIODS OF TIME WITH THE LOGIC CHASSIS IN THE MAINTENANCE POSITION! LOSS OF COOLING AIR (WHEN LOGIC CHASSIS IS RAISED) COULD CAUSE DRIVE TO OVERHEAT.....

FORMATTING:

WHEN FORMATTING PACKS THAT HAVE BEEN BOUGHT FROM ANOTHER VENDOR OR THE BAD BLOCK FILE HAS BEEN DESTROYED.... THE FORMATTER PROGRAM WILL PRINT OUT FIVE (5) ERROR MESSAGES BEFORE IT ASKS FOR A PACK SERIAL NUMBER.....

ANY NUMBER OTHER THAN ZERO (0) WILL BE ACCEPTED AS A PACK SERIAL NUMBER.....

CABLE PART NUMBERS:

THE 60 POSITION CABLE ("A" CABLE) PART # 70-14039-0-0

THE 26 POSITION CABLE ("B" CABLE) PART # 70-14038-0-0

RSX DISPATCH:

THE AUGUST RSX-11M SOFTWARE DISPATCH MAKES REFERANCE TO THE RM02/RM03 BEING UP TO REV BEFOR THE SOFTWARE WILL FUNCTION PROPERLY.... ALL THE ECO'S THAT ARE REQUIRED SHOULD HAVE BEEN INSTALLED IN ALL DRIVES BEFOR FCS (FIRST CUSTOMER SHIP).....

FOR YOUR INFORMATION THE TWO (2) MODULES IN QUESTION ARE THE M7686 AND THE M7684.

M7684 ECO #9 MUST BE IN MAKING THE CS REV A "L"

M7686 ECO #4 MUST BE IN MAKING THE CS REV A "E"

RSTS V 6C AND RM02/03:

BECAUSE OF THE DESIGN OF THE RM DISK DRIVE IF "VV" VOLUME VALID IS LOST BECAUSE OF A DRIVE FAULT, THE RSTS HANDLER WILL ISSUE A DRIVE CLEAR AND THE LED'S WITHIN THE DISK DRIVE WILL BE CLEARED LEAVING NO INDICATION OF ANY DRIVE ERROR...

IF THIS OCCURES ON THE SYSTEM DISK THE SYSTEM WILL GO "OUT TO LUNCH" THE NEXT TIME IT TRIES TO ACCESS THE DISK...

I AM LOOKING INTO A WAY AROUND THIS LED RESETTING PROBLEM AT THIS TIME... MORE TO COME .....

EMA COIL GOES BAD:

IF YOU GET SECTOR COMPAIR ERRORS AND AN OCCASIONAL DRIVE TIMING ERROR ONE AREA TO CHECK IS THE BEARINGS ON THE EMA COIL ASSY.....

LATEST RM02 AND RM03 DOCUMENTATION

		SHIPPED WITH SYSTEM
RM03 ILLUSTRATED PARTS BREAKDOWN	EK-ORM03-IP	NO
RM03 TECHNICAL MANUAL VOLUME 1 (BY CDC)	ER-ORM03-TM	NO
RM03 TECHNICAL MANUAL VOLUME 11 (BY CDC) THIS IS THE RM03 PRINT SET	ER-ORM03-MP	YES
RM02 ILLUSTRATED PARTS BREAKDOWN	EK-ORM02-IP	NO
RM02 TECHNICAL MANUAL VOLUME 1 (BY CDC)	ER-ORM02-TM	NO
RM02 TECHNICAL MANUAL VOLUME 11 (BY CDC) THIS IS THE RM02 PRINT SET	ER-ORM02-MP	YES
RM02/02 DISK SUBSYSTEM USERS GUIDE	EK-RM023-UG	YES
RM02/03 ADAPTER TECHNICAL DESCRIPTION MANUAL	EK-RM023-TD	NO
RM02/03 DISK SUBSYSTEM SERVICE MANUAL	EK-RM023-SV	NO
RM03 FIELD MAINTENANCE CUSTOMER PRINT SET ADAPTER PRINT SET	MP-00350	YES
RM02 FIELD MAINTENANCE CUSTOMER PRINT SET ADAPTER PRINT SET	MP-00456	YES

SOFTWARE

MAINDEC-11-DZRMA-B		RM03 FORMATTER (ONLY)
	CZRMA-C	RM02/RM03 FORMATTER
	DZRMB-A	PERFORMANCE EXERCISER
	CZRMB-B	" "
	DZRMC-A	FUNCTION TEST PART 1
	-A1	"OPI"ERRORS
	CZRMC-B	FUNCTION TEST PART 1
	-B1	"OPI" ERRORS
	-B2	SLIDE START UP
	DZRMD-A	FUNCTION TEST PART 2
	CZRMD-B	" " "
	-B1	SLIDE START UP
	-B2	"MDPE" ERRORS WITH MK-11 MEMORIES
	DZRME-A	FUNCTION TEST PART 3
	-A1	DATA LATE TEST 22
	CZRME-B	FUNCTION TEST PART 3
	-B1	SLIDE START UP
	DZRMF-A	EXTENDED DRIVE TEST
	-A1	I/O TRANSFER ERRORS
	CZRMF-B	EXTENDED DRIVE TEST
	DZRMG-A	DUAL PORT LOGIC TEST PART 1
	CZRMG-B	" " " " "
	DZRMH-A	DUAL PORT LOGIC TEST PART 2
	CZRMH-B	" " " " "
	DZRMI-A	DRIVE COMPATIBILITY TEST
	CZRMI-B	" " "
	DZRMJ-A	DISKLESS DIAGNOSTIC
	-A1	SOFTWARE TIMEOUT TEST 116
	-A2	"OPI" ERRORS
	CZRMJ-B	DISKLESS DIAGNOSTIC
	-B1	"OPI" ERRORS
	-B2	REQUIRED WHEN M7684 BD. IS AT CS REV "P"
	CZRMK-A	DISKLESS PART 2 (MAY 78)
	-A1	BUS RACE CONDITION

NOTES:

DZRMA-B RM DISK FORMATTER ONLY WORKS FOR RM03'S

CZRMA-C FORMATTER PROGRAM SUPPORTS BOTH RM02'S AND 03'S

IF THE DISK PACK HAS NOT BEEN FORMATTED BEFORE OR IF THE BAD BLOCK IMFORMATION HAS BEEN DISTROYED THEN 5 ERROR REPORTS WILL BE PRINTED BEFORE PROGRAM ASKED FOR A PACK SERIAL NUMBER.....

DECO'S/ DEPO'S

MAINDEC-11-DZRMC-A1 FUNCTION TEST PART 1

"OPI" ERRORS

24650	FROM	4737	TO 137
24652		43046	25446

DZRME-A1 FUNCTION TEST PART 3

DATA LATE ERROR IN TEST 22

30272	FROM	052702	TO 42702

DZRMF-A1 EXTENDED DRIVE TEST

I/O TRANSFER ERRORS

16640	FROM	1002	TO 240
17432		1002	240

DZRMJ-A1 DISKLESS DIAGNOSTIC

SOFTWARE TIMEOUT TEST 116

51110	FROM	74	TO 400

-A2 DISKLESS DIAGNOSTIC

"OPI" ERRORS

43010	FROM	005002	TO 137
43012		010037	43204

****

MAINDEC-11-CZRMC-B1 RM02/03 FUNCTION TEST PART 1

"OPI" ERRORS

25024	FROM	4737	TO 137
25026		43216	25622

-B2 RM02/03 FUNCTION TEST PART 1

SLIDE START UP

200	FROM	137	TO 12706
202		5322	1100
204		206	137
206		0	5322

CZRMD-B1 RM02/03 FUNCTION TEST PART 2

SLIDE START UP

200	FROM	137	TO 12706
202		5324	1100
204		206	137
206		0	5324

-B2 RM02/03 FUNCTION TEST PART 2

"MDPE" ERRORS WITH MK-11 MEMORIES

23760	FROM	63	TO 73
24506		63	73
25234		63	73

DECO'S/ DEPO'S CONT.

MAINDEC-11-CZRME-B1 FUNCTION TEST PART 3

SLIDE START UP	200	FROM	137	TO 12706
	202		5324	1100
	204		206	137
	206		0	5324

CZRMJ-B1 RM02/03 DISKLESS DIAGNOSTIC

"OPI" ERRORS	43136	FROM	5002	TO 137
	43140		10037	43332

-B2 RM02/03 DISKLESS DIAGNOSTIC

HARDWARE CHANGE MUST BE IN WHEN M7684 IS AT CS REV "P"

50452	FROM	4737	TO 137
50454		60654	50716
52372		12760	137
52374		141401	53500
56406		12705	137
56410		21	57176

CZRMK-A1 RM02/03 DISKLESS PART 2

BUS RACE CONDITION	13420	FROM	12737	TO 137
	13422		55401	13516
	20664		12703	137
	20666		20	21416
	24674		55401	51401
	24714		42705	52705
	24724		5337	137
	24726		24734	400

XX-DP AND DECX-11

THE FOLLOWING INFORMATION WAS CONTAINED ON SPEED BULLETIN # 62...

MD-ZZ-CZQXA-L	ADD DOCUMENTATION ON RM02/03 TO XXDP USERS MANUAL
CZQU6-A	CREATE A NEW "DRDP" MONITOR FOR XX-DP RRDP XX-DP RM02/03 MONITOR
CZQU2-C	ADD NEW DRIVER TO COPY 2 FOR RM02/03 XX-DP COPY 2 PROGRAM
CZQU1-C	ADD NEW DRIVER FOR RM02/03 IN UPD3 PROGRAM
CZQUR-L	ADD NEW DRIVER FOR RM02/03 IN UPD3R PROGRAM
CZQUS-E	UPDATE TEXT FILE TO REFLECT RM02/03 INFO IN HELP FILE..NOTE:USE PIP COMMAND TO TRANSFER FILE TO MASTER DISK.

CXRMA-C	NEW RH11,70	RM02/03 PROGRAM OBSOLETES ZZ-CXQLQ-B1
CXRMB-C	NEW RH11,70	RM02/03 DUAL PORT MODULE OBSOLETES ZZ-CXQLQ-B1

TOOLS AND TEST EQUIPMENT

RM03 FTU — RM02/03 FIELD TEST UNIT
USED TO TEST AN RM02 OR RM03 9762 DISK DRIVE OFF LINE. ***ENSURE THAT THE RM03-FTU HAS A AZPV HEAD ALIGNMENT CARD IN IT (REF FCO RM03-S-00013)

COST $2,015.00

SPECIAL TOOLS

CARRIAGE RAIL AND SPRING BEARING ALIGNMENT TOOLS USED IN REPLACING THE CARRIAGE RAILS AND/OR CARRIAGE COIL. ALIGNS UPPER AND LOWER RAILS PLUS ADJUSTS SPRING BEARING ON THE COIL ASSY.
*** REQUIRES SPECIAL TRAINING NOT TAUGHT IN NORMAL TRAINING CLASSES. CALL GREG EKHOLM FOR INFO.

COST $2,520.00

***RECOMMENDED ADDITION PARTS:

KW11-P PROGRAMMABLE CLOCK USED IN TIMING TESTS UNDER EXTENDED DRIVE TESTS (CZRMF-B)

VERY FINE *Crocus* CLOTH
PURCHASE AT HARDWARE STORE FOR USE ON HEAD ADJUSTMENT TOOL TO REMOVE BUILD UP OF DIRT/ETC ON TOOL

1. CONTROLLED DISTRIBUTION TOOLS (RM03/RM02)

PART NO.	DESCRIPTION	COST
29-13212	Torque Screwdriver	61.26
29-22933	Card Extender	80.30
29-22934	Spindle Alignment Tool	161.10
29-22935	Head Adjustment tool	31.43
29-22936	Torque Screwdriver Bit	5.48
29-22914	Speed Sensor Adjust	120.00
30-13992-02	CE Pack	775.20
RM03P	Data Pack	270.00
	TOTAL	$1,510.25

R 2/RM03 SITE PREP IMFO

VOLTAGE	TOLERANCE(V)	FREQ/TOL(HZ)	STEADY/STATE CURRENT	RM02 POWER	RM03 POWER
100 VAC	+10 -10V	50 +.2 -.2	12.5A	NONE	1210 KW
100 VAC	+10 -10V	60 +.1 -.1	11A	NONE	991 KW
120 VAC	+ 8 -18V	60 +.6 -1.0	12A/11A RM02/03	1100 KW	1050 KW
240 VAC	+17 -27V	50 +.5 -1.0	5A/5.5A " / "	1000 KW	1025 KW

****** ALL MODELS ARE SINGLE PHASE AND REQUIRE A 15A DEDICATED OUTLET ******

					RM02	RM03 BTU'S
RM**-AF	SINGLE PORT	RM**-BF	DUAL PORT	100V/50HZ	NONE	4128
RM**-AE	SINGLE PORT	RM**-BE	DUAL PORT	100V/60HZ	NONE	3378
RM**-AA	SINGLE PORT	RM**-BA	DUAL PORT	120V/60HZ	3770	3578
RM**-AD	SINGLE PORT	RM**-BD	DUAL PORT	240V/50HZ	3430	3500
RM03-C	DUAL ACCESS KIT (UPGRADES A SINGLE PORT TO A DUAL PORT OPTION)					
RM03-P	DISK PACK FOR USE ON RM02 OR RM03 DISK DRIVES					

PLUG TYPES:

	PLUG TYPE	RECEPTACLE TYPE
100V/50HZ, 100V/60HZ, & 120V/60 HZ	NEMA 5-15P	NEMA 5-15R
240V/50HZ	NEMA 6-15P	NEMA 6-15R

POWER CORD LENGTH (OUTSIDE OF DISK DRIVE) = = = = = = 6 FT.
WEIGHT = 430 LBS (450 LBS CRATED SHIPPING WT)
CABINET DIMENSIONS (H 9696 FREE STANDING CABINET) = = 22"W X 31"D X 39"H
OPERATING ALTITUDE = -1000 TO +6500 FT (-305 TO +2000 METERS)
OPERATING- TEMP 59°F - 90°F (15C-32C) MAX CHANGE 12°F(7C) PER HOUR HUMIDITY 20%-80%
SERVICE CLEARANCES - ALLOW 36" (91.44CM) IN FRONT AND BACK OF THE DISK DRIVE FOR SERVICING
CABLEING NOTES:

THE RM02/RM03 USES THE EQUIVALENT OF ONE FT OF MASS BUS LENGHT IN THE BACK PLANE OF EACH RM02/RM03 MASS BUS ADAPTER
FOR CALCULATING THE DRIVE LOCATION- THE RMXX USES 13 FT OF MASS BUS CABLE WITHIN THE DRIVES (6½FT IN AND 6½FT OUT) WHEN CONNECTING TWO DRIVES TOGETHER
FIVE (5) FT MUST BE ALLOWED TO CONNECT TO THE RH70 IN ADDITION TO THE 6½FT WITHIN THE DRIVE HENSE, THE FIRST DRIVE MAY BE LOCATED UP TO 13 FT FROM THE CONTROLLER.(STANDARD CABLE)
**REMEMBER - MAX MASS BUS CABLE LENGHT IS 160 FT.

GRDING REQUIREMENTS - - - #4 AWG EARTH GRD VIA CONTROLLER CABINET
CABLE LENGHTS = FIRST DRIVE IS SHIPPED WITH 25' CABLE
ADD ON DRIVES ARE SHIPPED WITH 15' CABLES
OPTIONAL CABLE LENGHTS ARE: BC06S-25 = 25 FT CABLE & BC06S-40 = 40 FT CABLE
CLEANLINESS = LESS THAN 1 MILLION PARTICLES PER CUBIC FT OF AIR WHICH ARE 0.5 MICRONS OR LARGER IN DIAMETER.

RM03 QUICK CHECK INSTALLATION

UNIBUS INTERFACE:

INTERRUPT VECTOR	254	M8153(RH70)
PRIORITY	BR 5	M8153(RH70)
DATA TRANSFER	NPR	
BUSS LOAD	1 BUS LOAD(RH70)	
DEVICE ADDRESSES	776700 - 776752	M8153 (RH70)
REGISTER SELECTION	22 REGISTERS	M8153 (RH70)

MECHANICAL:

	DISK	CONTROLLER(CPU)
MOUNTING-	1 FREE-STANDING UNIT	2 SYSTEM UNITS(RH70)
SIZE	22"W X 31"D X 39"H	
WEIGHT	430 LBS	
CABLES:		
CONTROLER TO DRIVE	25 FT STANDARD	40 FT OPTIONAL
DRIVE TO DRIVE	15 FT STANDARD	25 OR 40 FT OPTIONAL
TOTAL CABLE LENGTH	160 FT (INCLUDE 1 FT FOR EACH MBA BACKPLANE	

BTU'S — 4128 BTU/HR MAX WORST CASE

POWER — AVAILABLE IN 100V 50 OR 60 HZ
120V 60 HZ
240V 50 HZ

ALL APPROX 30 AMPS STARTING CURRENT - 15 AMPS RUNNING

ALL MODELS SINGLE PHASE

SPECIFICATIONS:

CAPACITY	67 MBYTES	
RPM'S	RM03= 3600	RM02= 2400
CYLINDERS	822	
SECTORS	30 or 32 — 16 BIT FORMAT = 32 SECTORS	
TRACKS	5 PLUS ONE SERVO	

****

FAULT CARD

LEDS:
- WRT FAULT
- HD SELECT FAULT
- WRT & RD FAULT
- NOT ON CYL & WR+RD
- VOLTAGE FAULT

→ LIGHTS LED AND OPERATORS PANEL CLEARS READY AND SIGNALS CONTROLER(FAULT) AND DISABLES WRT CKT

- SPEED + VOLTAGE → ENABLES WRT PROTECT TO CONTROLER. DISABLES WRT CKT
- SERVO TRACK(NO SERVO DIBITS) → ENABLES WRT PROTECT, FAULT TO CONT; LIGHTS OPERATORS PANEL FAULT
- SEEK ERROR → ENABLES SEEK ERROR TO CONT. INHIBITS SEEK LOGIC

ERROR LINES = FAULT AND SEEK
STATUS LINES = ON CYLINDER, UNIT READY, WRITE PROTECT, PLUG VALID

digital

FIELD SERVICE TECHNICAL MANUAL

12 Bit ☐	16 Bit ☒	18 Bit ☒	32 Bit ☐	36 Bit ☒

Option or Designator: RM02/3

Title: DIAGNOSTIC FAILURES ON RPØ4, RPØ5/6, RMØ2/3			Tech Tip Number: RM02/3-TT-1
Author: Bill Davis/John Kwolek	F.S. Office: Nagog Woods	Date: 6.5.78	Revision: 0
Processor Applicability: All 11/40	Mgr./Sup.: Harry Dugas	Date: 5/16/78	Cross Reference
	Approval: Harry Dugas	Date	

1. There is a chance of diagnostic failures on disks capable of formatting in 16 bit and 18 bit modes when connected to an 11/40. Typically, failures will occur in 18 bit mode due to an internal CPU jumper.

2. When testing the 18 bit data field function, the diagnostics use the PA and PB unibus lines.

3. On PDP-11/40's without Parity Memory, jumper W5 on the M7234 CPU timing board is inserted, grounding the PA line, and thus disabling bit 17 of the 18 bit data field.

4. If failures occur in the 18 bit mode, check to see if W5 on the M7234 is in. If so, cut the jumper.

5. On KL10's with the 11/40 as a front end, this jumper should always be removed, regardless of the memory configuration (i.e., parity or non-parity).

Title: RM03/RM02 TROUBLESHOOTING			Tech Tip Number: RM02/3-TT-2
Author: D.MCELVANEY/L.BUCHANAN	F.S. Office: MAYNARD	Date: 6/9/78	Revision: B
Processor Applicabilty: All 11	Mgr./Sup.: LARRY GOELZ	Date: 6/9/78	Cross Reference
	Approval: Larry Goelz	Date: 6/9/78	

READ THIS BEFORE YOU START TROUBLESHOOTING

THIS TECH TIP IS TO EMPHASIZE THE IMPORTANCE OF THE ± 5 VOLT ADJUSTMENT ON RM03/02 DISK DRIVES. THE SPECIFICATIONS FOR THIS ADJUSTMENT ARE 5.1 ± .05 VOLTS POSITIVE AND NEGATIVE. A DVM ACCURATE TO .01 VOLTS MUST BE USED TO MADE THE ADJUSTMENT, NOT A SCOPE. ALSO, THE VOLTAGE MUST BE MEASURED ON THE LOGIC CHASSIS WHILE PERFORMING REPETITIVE SEEKS FROM CYLINDER 0 TO 32. ANOTHER METHOD THAT HAS BEEN FOUND EFFECTIVE IS TO SET THE VOLTAGE AT 5.12 TO 5.15 VDC WITHOUT PERFORMING THE SEEKS.

THIS ADJUSTMENT MAY DRIFT AND SHOULD BE CHECKED FREQUENTLY, PARTICULARLY IF THE UNIT IS CLOSE TO AN AIR CONDITIONING VENT OR THE SITE TEMPERATURE VARIES APPRECIABLY. ALWAYS CHECK THIS ADJUSTMENT BEFORE AND AFTER ANY C.M. ON THE DRIVE, AS A VERY SMALL ERROR IN THIS ADJUSTMENT CAN APPEAR AS RANDOM ERRORS OF ANY TYPE. PERFORMING THE 5 VOLT ADJUSTMENT AS A REGULAR PART OF PM WILL SIGNIFICANTLY REDUCE INTERMITTENTS ON THIS (OR ANY) C.D.C. DRIVE.

THE PLUS FIVE VOLT REGULATOR FOR THE MBA, RH7Ø, CACHE, AND MEMORY MANAGEMENT SHOULD BE SET FOR 5.Ø5 TO 5.1Ø.

CONTROL DATA CORPORATION

TECH TIP-OEM
PREPARED BY
CUSTOMER SERVICES
NORMANDALE OPERATIONS

TECH TIP - SMD

TOOLS AND TEST EQUIPMENT

STORAGE MODULE DRIVES REQUIRE PERIODIC MAINTENANCE, BE IT PREVENTIVE OR REPAIR. PROPER MAINTENANCE REQUIRES THE USE OF CERTAIN "SPECIAL TOOLS, MATERIALS AND TEST EQUIPMENT".

FIELD REPORTS INDICATE SPORADIC USAGE OF IMPROPER, NON-CALIBRATED, SUBSTITUTE TOOLS, RESULTING IN MISADJUSTED AND/OR BROKEN PARTS (ESPECIALLY REGARDING THE TORQUE SCREW-DRIVER AND BIT USED ON HEAD CLAMPING HARDWARE).

THE MAINTENANCE MANUAL CONTAINS A LIST OF "SPECIAL TOOLS, MATERIALS AND TEST EQUIPMENT" NECESSARY FOR PROPER MAINTENANCE OF THIS EQUIPMENT.

BEYOND REQUIRED USAGE OF COMMON HAND TOOLS SUCH AS WRENCHES, SCREWDRIVERS, ETC, IT IS STRONGLY RECOMMENDED THAT MAINT-ENANCE PERSONNEL USE ONLY THOSE SPECIFIC TOOLS LISTED IN THE MANUAL.

SUBMITTED BY TECH SERVICES: G. Collins 2-24-78

APPROVED BY APPLICATIONS ENG: R.A. Belisle

CONTROL DATA CORPORATION

TECH TIP-OEM
PREPARED BY
CUSTOMER SERVICES
NORMANDALE OPERATIONS

TECH TIP - SMD

HEAD ARM ALIGNMENT PROCEDURE

THE MAINTENANCE MANUAL SPECIFICALLY INSTRUCTS FIELD PERSONNEL TO UTILIZE CORRECT TOOLS AND PROCEDURES WHEN PERFORMING "HEAD ARM ALIGNMENT".

THIS TECH TIP IS INTENDED TO EMPHASIZE THE CRITICAL NATURE OF THIS PROCEDURE AND HOPEFULLY PREVENT ANY FURTHER HEAD ARM OR ALIGNMENT TOOL DAMAGE DUE TO UNFAMILIARITY.

1. READ AND UNDERSTAND THE "HEAD ARM ALIGNMENT" PROCEDURE AS EXPLAINED IN THE MAINTENANCE MANUAL.
2. USE ONLY THE SPECIFIED ALIGNMENT TOOL AND CALIBRATED TORQUE SCREWDRIVER/BIT.
3. ENSURE THE ALIGNMENT TOOL IS CLEAN AND FREE OF DAMAGE.
4. ENSURE THE HEAD MOUNTING SCREWS ARE TIGHTENED TO THE SPECIFIED TORQUE REQUIREMENT. (DAMAGE TO THE TOOL OR HEAD ARM CAN OCCUR IF ADJUSTMENT IS ATTEMPTED ON A HEAD THAT HAS BEEN TIGHTENED EXCESSIVELY.)
5. WHEN INSERTING THE ADJUSTMENT TOOL, LOCATE THE HEAD ARM SLOT WITH THE TIP OF THE TOOL, PRIOR TO APPLYING ANY TURNING FORCE.
6. WHEN TURNING THE TOOL, ENOUGH INWARD FORCE SHOULD BE APPLIED ON THE TOOL, SO AS TO PREVENT THE TIP OF THE TOOL FROM DISENGAGING FROM THE ADJUSTMENT SLOT.

NOTE: "ROUNDING-OUT" OF THE HEAD ARM ADJUSTMENT SLOT PREVENTS FURTHER ADJUSTMENT OF THAT PARTICULAR HEAD AND MAY ULTIMATELY REQUIRE REPLACEMENT.
STEPS 4, 5 AND 6 ARE ESPECIALLY INTENDED TO PREVENT "ROUNDING-OUT" OF THE HEAD ARM ADJUSTMENT SLOT AND/OR DAMAGE TO THE ADJUSTMENT TOOL.

SUBMITTED BY TECHNICAL SERVICES: R. Stohlheid
APPROVED BY ENGINEERING: Gerald Krein

CDC CORPORATION
TECH TIP-OEM
PREPARED BY
CUSTOMER SERVICES
NORMANDALE OPERATIONS

TECH TIP - SMD

HEAD/DISK CLEANING SOLUTION

Field reports and chemical analysis of returned heads and disks indicate sporadic useage of improper or contaminated cleaning solutions. The maintenance manual repeatedly CAUTIONS users regarding the critical nature of head and disk cleaning, proper procedure performed by trained personnel, and use of recommended tools and materials.

This Tech Tip is intended to EMPHASIZE:

IF HEAD AND/OR DISK CLEANING IS NECESSARY, USE ONLY THE CLEANING SOLUTION AND PROCEDURES RECOMMENDED IN THE MAINTENANCE MANUAL.

NOTE: Disk cleaning allows for an optional cleaning solution, but recommends the media cleaning solution listed in the Maintenance Tools and Materials section of the manual.

Head cleaning requires use of the media cleaning solution only.

Submitted by Tech Services: R. F. Goddard

Approved by: [signature] 6-9-78

CORPORATION
ECH TIP-OEM
REPARED BY
JSTOMER SERVICES
ORMANDALE OPERATIONS

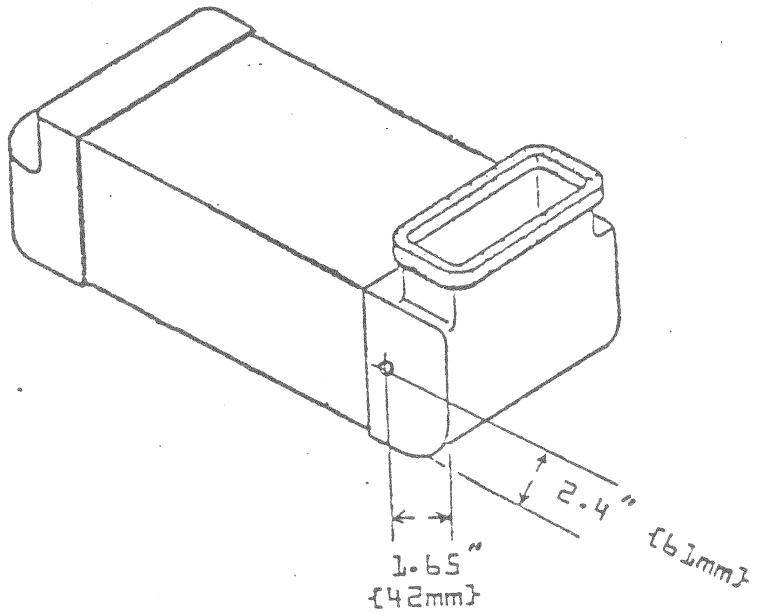
TECH TIP - SMD
9760/9762

SUBJECT: SMD ABSOLUTE FILTER REPLACEMENT DETERMINED BY FILTER-FLOW PRESSURE MEASUREMENT.

REQUIREMENT: DIFFERENTIAL PRESSURE GAUGE KIT, P/N 73040100 (ACQUIRE SAME AS MAINTENANCE TOOLS & MATERIALS)

IF ABSOLUTE FILTER DOES NOT HAVE A HOLE AND PLASTIC PLUG INSERTED AT LOCATION SHOWN IN FIGURE BELOW, REMOVE FILTER FROM DRIVE AND DRILL .25 INCH (6.35mm) HOLE. THOROUGHLY CLEAN SHAVINGS FROM FILTER BEFORE INSTALLING BACK INTO DRIVE. PLASTIC PLUG MUST BE INSERTED AT ALL TIMES EXCEPT WHEN TAKING PRESSURE MEASUREMENT.

PROCEDURE: REMOVE POWER FROM DRIVE. INSURE PRIMARY FILTER IS CLEAN AND ALLOWING MAXIMUM AIR FLOW.
GAIN ACCESS TO ABSOLUTE FILTER, REMOVE PLASTIC PLUG AND INSERT TUBING ATTACHED TO PRESSURE GAUGE.
APPLY POWER TO DRIVE AND LOAD HEADS. IF PRESSURE IS .5 INCH-WATER OR LESS, FILTER SHOULD BE REPLACED.
IF PRESSURE IS ABOVE .5 INCH-WATER, FILTER NEED NOT BE REPLACED AT THIS TIME. REMOVE TUBING, INSERT PLUG, AND RETURN UNIT TO NORMAL OPERATION.



SUBMITTED BY TECH SERVICES: P. Ellick

APPROVED BY ENGINEERING DEPT: B. Stubbs

CONTROL DATA CORPORATION

TECH TIP-OEM
PREPARED BY
CUSTOMER SERVICES
NORMANDALE OPERATIONS

TECH TIP —SMD

BK4XX/BK5XX UNITS

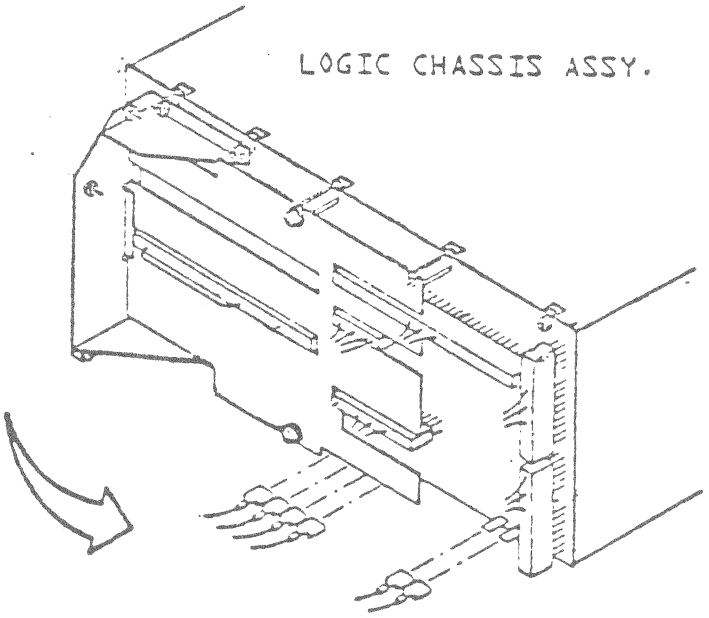
SPORADIC ±5 VOLTAGE DRIFT

BACKGROUND: FIELD REPORTS OF SPORADIC VOLTAGE FAULTS HAVE BEEN TRACED TO POSSIBLE DETERIORATING CONTACTS OF THE ±5 VOLT RECEPTACLES AT THE LOGIC CHASSIS. (SEE FIGURE BELOW) SINCE THE FACTORY HAS BEEN UNABLE TO DUPLICATE THE REPORTED PROBLEM, IT IS SUSPECTED THAT AN UNKNOWN COMBINATION OF TEMPERATURE, HUMIDITY AND AIR FLOW, MAY BE HAVING AN ADVERSE AFFECT ON THESE CONTACTS.

SOLUTION: SOLDERING THESE CONNECTIONS HAS BROUGHT POSITIVE RESULTS AT THOSE FIELD SITES ORIGINALLY REPORTING THE PROBLEM.

IF ANY VOLTAGE DRIFT PROBLEMS ARE BEING EXPERIENCED, IT MAY BE ADVANTAGEOUS TO SOLDER THESE SLIDE-ON RECEPTACLES TO THE CONNECTING TABS, ESPECIALLY THE ±5 AND ±20 VOLT CONNECTIONS.

LOGIC CHASSIS ASSY.



SUBMITTED BY: TECHNICAL SERVICES

APPROVED BY: APPLICATIONS ENG. Robert J. Smith

VOLT/FREQUENCY DEPENDENT COMPONENT

Note:- RM03 3600RPM=BK5BXX
RM02 2400RPM=BK8AXX

	BK5B5 (120V/60HZ)	BK5B5H(240V/50HZ)	BK8A1A(120V/60HZ)	BK8A1B(240V/50HZ)
VARISTOR CDC#	NONE	94395600	NONE	94395600
DEC#	-	-	-	-
BLOWER ASSY	75240304 29-22901	75240305 29-22902	75240304 29-22901	75240305 29-22902
SW SOLID STATE RUN/START TRIAC	94371305/76427404 29-22929	94376501/76427406 -	94371305/76427404 29-22929	94376501/76427406 -
HOUR METER	94313800 29-22893	94313807 29-22924	94313800 29-22893	94313807 29-22924
TRANSFORMER	76840400 29-22907	76846800 29-22908	76840400 29-22907	7684800 29-22908
P.S. CKT BREAKER	92696065 29-22917	92696079 29-22918	92696065 29-22917	92696079 29-22918
MAIN CKT BREAKER	94245217 29-22922	94245205 29-22921	94245217 29-22922	94245205 29-22921
DRIVE BELT	92314113 29-22915	92314119 29-22916	92314099 29-23110	92314115 29-23120
DRIVE MOTOR KIT	47204303 29-22911	47204310 29-22912	47204301 29-23121	47204309 29-23122
CAP DRIVE MOTOR	94255116 29-22923	94255109/94255101 S/C 15-19 S/C 20' 29-22937/29-22937	94255112 29-23137	94255109/94255101 S/C 15-19 - S/C 20' 29-22937/29-22937
POWER CABLE	75259410 -	75259409 -	75259410 -	75259409 - 94255120

RM02/RM03 DEC to CDC PARTs

CD KIT	Description	RM03 DEC #	BK5B5 #	RM02 DEC #	BK8A1 #
03	Fuse 2A 250V	29-22872	95 647602	same	
03	Fuse 8A 250V	29-22873	95 647606	same	
--	Magnet Assy	29-22874	47 200700	same	
03	HRVV RX	29-22875	54 147709	same	
03	ASGV speed detect	29-22876	54 152505	same	
03	ASHV (BSHV) Power Sup.	29-22877	54 152901(902)	same (fuse change only)	
03	5SJV Power Supply	29-22878	54 153300	same	
03	5SKV Power Supply	29-22879	54 153700	same	
03	JTVV Transmitter	29-22880	54 167710	same	
03(02)	HFRV (JFRV) Fine servo	29-22881	54 226113	29-23112	54 226114
03	EKFV Fault Reg	29-22882	54 262105	same	
03	FLPV Servo Control	29-22883	54 275307	same	
03	JLQV D/A Converter	29-22884	54 275710	same	
03(02)	HLRV (LLRV) Data Latch	29-22885	54 276108	29-23113	54 276113
03(02)	CLSV (BLSV) WRITE PLO	29-22886	54 276503	29-23111	54 276502
03(02)	ELTV (NLTV) A-Cont/Sect	29-22887	54 276906	29-23116	54 276914
03	ELUV A-Cont 2	29-22888	54 277306	same	
03	MLVV A-Cont 1	29-22889	54 277713	same	
03	FLWV Diff Generator	29-22890	54 278107	same	
03	ELXV NRZ to MFM	29-22891	54 278505	same	
03(02)	BLZV (CLZV) Read PLO	29-22892	54 279303	29-23114	54 279304
--	Meter hour 60 hz	29-22893	94 313800	same	
03	FZQN Servo PreAmp	29-22894	73 485311	same	
03(02)	R/W HD lower	29-22895	75 010102	29-23109	75 010302
03(02)	R/W HD upper	29-22896	75 010103	29-23107	75 010303
03(02)	R/W HD servo	29-22897	75 010105	29-23108	75 010305
03(02)	NZJN (SZJN) HD sel/amp	29-22898	75 061715	29-23119	75 061719
03(02)	EZKN (DZKN) WR driver	29-22899	75 062107	29-23118	75 062106
--	Spindle Assy	29-22900	75 074714	same	
03	Blower Assy 60hz	29-22901	75 240304	same	

CD KIT	Description	RM03 DEC #	BK5B5 #	RM02 DEC #	BK8A1 #
03	Blower Assy 50 HZ	29-22902	75 240305	same	
03	Brake assy hysteresis	29-22903	75 241500	same	
03	Control Panel assy	29-22904	76 422501	same	
--	Flex Lead assy	29-22905	76 426800	same	
03	Transducer Assy	29-22906	76 427300	same	
--	Transformer 60hz	29-22907	76 840400	same	
--	Transformer 50 hz	29-22908	76 846800	same	
03	Speed Sensor assy	29-22909	77 387101	same	
--	Carriage & Coil assy	29-22910	77 398303	same	
03(02)	Motor Drive 60 hz	29-22911	47 204303	29-23121	47 204301
03(02)	Motor Drive 50 hz	29-22912	47 204310	29-23122	47 204309
03	5VTN Servo Power	29-22913	77 569100	same	
03	Tool sensor height adj	29-22914	87 052600	same	
03(02)	Drive Belt 60 hz	29-22915	92 314113	29-23110	92 314099
03(02)	Drive Belt 50 hz	29-22916	92 314119	29-23120	92 314115
--	CKT Breaker 5A/60hz p/s	29-22917	92 696065	same	
--	CKT Breaker 5A/60hz p/s	29-22918	92 696079	same	
03	Sw Interlock	29-22919	93 560002	same	
03	Sw mini	29-22920	93 786005	same	
--	CKT Bkr 8A 50hz Main	29-22921	94 245205	same	
--	CKT Bkr 5A 60hz Main	29-22922	94 245217	same	
--	242-292(161-193)MFD 60hz	29-22923	94 255116	29-23137	94 255112
--	Meter hour 50 hz	29-22924	94 313807	same	
03	Filter air 15.77 x 11	29-22925	94 364700	same	
03	Filter air	29-22926	00 815481	same	
--	4MFD 370VAC cap	29-22927	94 365800	same	
--	Line Filter 10A	29-22928	94 371200	same	
03	Sw Solid State (TRIAC)	29-22929	76 427404	same (replaces 94-371303 & 5)	
--	21000 MFD 50VDC	29-22930	95 578111	same	
03	Card extender	29-22933	54 109701	same	

RM02/RM03 DEC to CDC Part #'s cont

CD KIT	Description	RM03 DEC #	BK5B5 #	RM02 DEC #	BK8A1 #
03	Carr/Spindle Adj tool	29-22934	75 018400	same	
03	Head Adj tool	29-22935	75 018804	same	
03	Bit 1/4 Hex Hd Adj	29-22936	87 016701	same	
--	6 MFD 660VAC	29-22938	95 686701	same	
--	Rail,lower carr guide	29-23028	75 063600	same	
--	Rail,upper carr guide	29-23029	75 063700	same	
--	270-324 MFD Cap 50hz	29-22937	94 255109	same	(s/c 15-19)
	" "	"	94 255101	same	(s/c 20 up)

digital

FIELD CHANGE ORDER

FCO RM03 | S | 0013 | PAGE 1 of 1

Level of Urgency (LOU)

STATUS / LOU	FCO EXPENSE RESPONSIBILITY: WARRANTY	CONTRACT	PER CALL
Mandatory	DIGITAL		
Required			
Specification			
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on-site) (Travel time not included)

0.3 DECIMAL HOURS

RM02
RJM02
RWM02

APPLICABILITY

EXCHANGE JFSV (2,400 RPM) AND HFSV (3,600 RPM) HEAD ALIGNMENT BOARDS WITH AZPV (2,400/3,600) UNIVERSAL HEAD ALIGNMENT BOARD.

RETURN ~~HFSV AND~~/OR JFSV TO S/R 126 BY 30 MARCH 1978 USING PART NUMBER EQ-00900-00. 2 Low Mass mounts changed to 28 Feb 79

TO RECEIVE CREDIT: USE RAC # 8037.

QUICK CHECK (To determine if FCO has been installed)

PRESENCE OF AZPV BOARD IN FTU.

LAST PREVIOUS FCO s NONE

RELATED OR PREREQUISITE FCO s / MCO s

NONE

SPECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES (Not included in the Field Retrofit Kit)

FIELD INSTALLATION and TEST PROCEDURE

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	☒ FCO ☐ MONTS $5.00	::	

Parts charges are as of FCO release date and are subject to change.

PARTS AVAILABILITY DATE DECEMBER 1978

LOGISTICS CODING (174) (174) (200)

LOGISTICS REVIEW

QTY	PART NUMBER	DESCRIPTION
1	29-23202	CDC FCO KIT, 89053483

ORDER BY THIS NUMBER	KIT INCLUDES FCO	PRINTS	PARTS
EQ-0900-00	X		X
FA-04064-00	X		

:: PARTS PRICE UNDETERMINED AT DATE OF FCO RELEASE

NOTES: COMPATIBILITY NOTE: AZPV (2,400/3,600 RPM) HEAD ALIGNMENT BOARD MAY BE USED ON RM02 AND RM03.

AFFECTED PM PROCEDURE: RM03 HEAD ALIGNMENT PROCEDURE AND RM02 HEAD ALIGNMENT PROCEDURE

APPROVED - Field Service Product Support

GREG EKHOLM

11/2/78 Signed

DISTRIBUTION CODING

LIST 11,10

LKQ 200

FCO RELEASE DATE

DEC 12-(551)-1095A-R175

digital

FIELD CHANGE ORDER

FCO 7013398 | S | 0004 | PAGE 1 of 2

Level of Urgency (LOU)

STATUS / LOU	FCO EXPENSE RESPONSIBILITY: WARRANTY	CONTRACT	PER CALL
Mandatory	DIGITAL		
Required			
Specification			
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on-site) (Travel time not included)

1.0 DECIMAL HOURS

FCR-

RM02
RM03
RJM02
RWM02

APPLICABILITY

RETROFIT ALL 7013398'S (RM02/RM03 BACKPLANE) FROM WIRE LIST REVISION "A" TO "B" WHEN PROBLEM SYMPTOM IS EVIDENT.

THE MINIMUM REVISION TO BE PHASED-IN TO SPARES STOCK IS WIRE LIST REVISION "B".

QUICK CHECK (To determine if FCO has been installed)

WIRE ADD FROM F05C1 TO F05C2.

LAST PREVIOUS FCO s: NONE

RELATED OR PREREQUISITE FCO s / MCO s

M5922-S0001, M5923-S0001, M7686-S0005

SPECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES (Not included in the Field Retrofit Kit)

WIRE WRAP/UNWRAP TOOL

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	☒ FCO ☐ PRINTS $5.00	NONE	

Parts charges are as of FCO release date and are subject to change.

PARTS AVAILABILITY DATE

LOGISTICS CODING (800) (0) (50)

LOGISTICS REVIEW

QTY PART NUMBER DESCRIPTION

FIELD INSTALLATION and TEST PROCEDURE

PRELIMINARY

This Copy Dated OCT 27 1978

ORDER BY THIS NUMBER	KIT INCLUDES FCO	PRINTS	PARTS
FA-04096-00	X		

NOTE: INDICATE WIRE LIST CHANGE OR DRAWING D-CS-M5922-0-0 SHEET 2 OF 2. REFERENCE UPDATED WIRE LIST ON MICROFICHE FOR CHANGES.

NOTES: WHEN FIVE OR MORE RM02/RM03'S ARE DAISY CHAINED TOGETHER, THIS FCO MAY BE REQUIRED.

PROBLEM SYMPTOMS: PARITY ERRORS OR NED (NON-EXISTANT DRIVE) ERRORS ON SYSTEMS USING FIVE OR MORE RM02'S/RM03'S.

APPROVED - Field Service Product Support

GREG EKHOLM

DISTRIBUTION CODING

LIST 11,20,VAX

LKQ 50

FCO RELEASE DATE

digital

FIELD CHANGE ORDER

FCO 7014035 | I | 0001 — PAGE 1 of 3

Level of Urgency (LOU)

APPLICABILITY

RETROFIT RM02 OR RM03 DRIVES ONLY WHEN THE RUN TRIAC FAILS AND THERE ARE NO ACCESS HOLES IN THE TOP PAN OF THE H9691 CABINET ASSEMBLY.

STATUS / LOU	FCO EXPENSE RESPONSIBILITY		
	WARRANTY	CONTRACT	PER CALL
Mandatory	DIGITAL		
Required			
Specification			
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on-site) (Travel time not included)

2.0 DECIMAL HOURS

FCR- RM02
RM03
RJM02
RWM03

QUICK CHECK (To determine if FCO has been installed)

PRESENCE OF MOUNTING PLATE ON BASE OF RUN TRIAC

LAST PREVIOUS FCO s: NONE

RELATED OR PREREQUISITE FCO s / MCO s

SPECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES (Not included in the Field Retrofit Kit)

DOW CORNING #4 HEAT SINK COMPOUND 90-09299-00.

FIELD INSTALLATION and TEST PROCEDURE

SEE PAGE 2 OF THIS FCO.

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	[X] FCO [ ] PRINTS $10.00	*	

Parts charges are as of FCO release date and are subject to change.

PARTS AVAILABILITY DATE March 1979

LOGISTICS CODING (800) (100) (120)

LOGISTICS REVIEW Ron S Moore 28 Dec 78

QTY	PART NUMBER	DESCRIPTION
1	74-22194	REWORK TRIAC MOUNTING PLATE
2	90-06020-01	SCREW, PHL. PAN HD., 6-32 X ¼, LG.

* PARTS PRICE UNDETERMINED AT DATE OF FCO RELEASE.

ORDER BY THIS NUMBER	KIT INCLUDES FCO	PRINTS	PARTS
EQ-00931-00	X		X
FA-04106-00	X		

NOTES:
1. THIS FCO REQUIRES MORE THAN ONE PERSON TO PERFORM THE REWORK TO REMOVE THE DISK DRIVE FROM THE CABINET.
2. ONCE THIS FCO IS INSTALLED, THE DISK DRIVE WILL NOT HAVE TO BE REMOVED FROM THE H9691 CABINET TO REPLACE THE RUN TRIAC.

APPROVED - Field Service Product Support

Gregory L Ekholm

GREG EKHOLM

DISTRIBUTION CODING

LIST 11-DECSYS-20

jc

FCO RELEASE DATE

DEC 12-(551)-1095A-R175

digital

FIELD CHANGE ORDER

Green Copy

FCO M7684 S 0002 1 of 2

Level of Urgency (LOU)

STATUS / LOU	FCO EXPENSE RESPONSIBILITY		
	WARRANTY	K	PER CALL
Mandatory	DIGITAL		
Required			CUST
Specification			CUST
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on-site) (Travel time not include...

0.5 DECIMAL HOURS

FCR-RM02
RM03

PPLICABILITY

EXCHANGE ALL ETCH REVISION "B" OR EARLIER M7684'S WITH AN M7684 AT ETCH REVISION "C" OR LATER WHEN USED ON RM02. THE MINIMUM ACCEPTABLE REVISION OF THE M7684 TO BE PHASED-IN TO SPARES STOCK IS ETCH REVISION"C", CS REVISION "C".

QUICK CHECK (To determine if FCO has been installed)

JUMPER W1 ADDED BETWEEN E71 AND E80

LAST PREVIOUS FCO s: NONE

RELATED OR PREREQUISITE FCO s / MCO s

FCO M7685-S0001 (FA-04028-00)

PECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES
Not included in the Field Retrofit Kit)

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	☒ FCO ☑ Prints $10.00		

Parts charges are as of FCO release date and are subject to change

PRELIMINARY

ELD INSTALLATION and TEST PROCEDURE

This Copy Dated JUL 27 1978

PARTS AVAILABILITY DATE

LOGISTICS CODING (100) (Ø) (20)

LOGISTICS REVIEW

ORDER BY KIT INCLUDES

KIT NUMBER	FCO	PRINTS	PARTS
EQ-00888-00	X	X	X
FA-04027-00	X	X	
FA-04027-01	X		
FA-04027-02		X	

QTY	PART NUMBER	DESCRIPTION
1	M7684	MODULE, AT ETCH REVISION "C", CS REVISION "C" OR LATER.

FAILURE SYMPTOMS: ETCH REVISION"B" M7684 WILL NOT FUNCTION PROPERLY IN AN RM02.

OTES:

COMPATIBILITY NOTE: 1. WHEN THE ETCH REVISION "C" M7684 IS USED ON AN RM02, JUMPER W1 MUST BE INSTALLED.
2. WHEN THE ETCH REVISION "C" M7684 IS USED ON AN RM03, JUMPER W1 MUST BE REMOVED.

APPROVED - Field Service Product Support

GREG EKHOLM

DISTRIBUTION CODING

☐ To all Field Offices
☐ To Regional Offices

LIST 11
EDQ

EKQ 20

APPROVED - Technical Documentation

FCO RELEASE DATE

digital

FIELD CHANGE ORDER

FCO M7684 | S | 0012 | PAGE 1 of 2

Level of Urgency (LOU)

STATUS / LOU	FCO EXPENSE RESPONSIBILITY: WARRANTY	CONTRACT	PER CALL
Mandatory	DIGITAL		
Required			
Specification			
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on-site) (Travel time not included)
2.0 DECIMAL HOURS

FCR-RM02
RM03
RJM02
RWM03

APPLICABILITY

REWORK ALL ETCH REVISION "C" AND "D" M7684'S AT CS REVISION "N" OR EARLIER TO CS REVISION "P" WHEN PROBLEM SYMPTOMS ARE EVIDENT.

THE MINIMUM ACCEPTABLE REVISION OF THE M7684 TO BE PHASED-IN TO SPARES STOCK IS CS "P".

PRELIMINARY

This Copy Dated NOV 28 1976

SPECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES (Not Include Field Maint. Kit)

QUICK CHECK (To determine if FCO has been installed)
E39 CHANGED FROM 23-021B8 TO 23-023B8

LAST PREVIOUS FCO s: S02

RELATED OR PREREQUISITE FCO s / MCO s

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	☒ FCO ☐ PRINTS $10.00	*	

Parts charges are as of FCO release date and are subject to change.

PARTS AVAILABILITY DATE

LOGISTICS CODING (800) (200) (250)

LOGISTICS REVIEW

FIELD INSTALLATION and TEST PROCEDURE

SEE PAGE 2 OF THIS FCO.

COMPATIBILITY NOTE: WHEN THE M7684 AT CS REVISION "P" IS USED ON AN RM02 OR RM03, RUN THE APPROPRIATE DIAGNOSTIC:

DECSYSTEM-20/20 - DSRMBSAV VER.01
VAX-11/780 - CZRMJ-B-02
PDP-11'S - CZRMK-A-01

QTY	PART NUMBER	DESCRIPTION
1	23-023B8	PROM CHIP

* PARTS PRICE UNDETERMINED AT DATE OF FCO RELEASE.

ORDER BY THIS NUMBER	KIT INCLUDES FCO	PRINTS	PARTS
EQ-00933-00	X		X
FA-04108-00	X		

PROBLEM SYMPTOMS: DRIVE OCCASIONALLY LATCHES A MID-TRANSFER SEEK COMMAND AS A RE-CALIBRATE OR OFFSET COMMAND, RESULTING IN HCE (HEADER COMPAIR ERROR).

APPROVED - Field Service Product Support

GREG EKHOLM

DISTRIBUTION CODING

LIST 11-VAX-DECSYS-2020 | LKQ 250

FCO RELEASE DATE

DEC 12 '551) 1096A-R176

digital

FIELD CHANGE ORDER

FCO M7685 S 0001 1 2

Level of Urgency (LOU)

STATUS TO	FCO EXPENSE RESPONSIBILITY		
	WARRANTY	K	PER CALL
Mandatory	DIGITAL		
Required			CUST
Specification			CUST
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on site) (Travel time not included)

0.5 DECIMAL HOURS

FCR- RM02
RM03

APPLICABILITY

EXCHANGE ALL ETCH REVISION "B" OR EARLIER M7685'S WITH AN M7685 AT ETCH REVISION "C" OR LATER WHEN USED ON RM02.

QUICK CHECK (To determine if FCO has been installed)

JUMPER W1 ADD'ED BETWEEN E60 AND E69

LAST PREVIOUS FCO s: NONE

RELATED OR PREREQUISITE FCO s / MCO s

FCO M7684-S0002 FA-04027-00

SPECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES (Not included in the Field Retrofit Kit)

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	☒ FCO ☒ Prints $5.00	*	

Parts charges are as of FCO release date and are subject to change.

FIELD INSTALLATION and TEST PROCEDURE

8-7-78

PARTS AVAILABILITY DATE: SEPTEMBER 1978

LOGISTICS CODING: (X) (Ø) (50)

LOGISTICS REVIEW: 3 Aug 78

QTY	PART NUMBER	DESCRIPTION
1	M7685	MODULE AT ETCH REVISION "C", CS REVISION "B" OR LATER.

PRELIMINARY
This Copy Dated AUG 7 1978

ORDER BY THIS NUMBER	KIT INCLUDES FCO	PRINTS	PARTS
EQ-00-889	X		X
FA-04028-00	X		X

*PARTS PRICE UNDETERMINED AT DATE OF FCO RELEASE.

NOTES: COMPATIBILITY NOTE: 1. WHEN THE ETCH REVISION"C" M7685 IS USED ON AN RM02, JUMPER W1 MUST BE INSTALLED. 2. WHEN THE ETCH REVISION "C" M7685 IS USED ON AN RM03, JUMPER W1 MUST BE REMOVED.
FAILURE SYMPTOMS: ETCH REVISION "B" M7685 WILL NOT FUNCTION PROPERLY ON RM02.

APPROVED - Field Service Product Support

GREG EKHOLM

DISTRIBUTION CODING

☐ To all Field Offices
☐ To Regional Offices

LIST (DX) 11

LKO 50

APPROVED - Technical Documentation

FCO RELEASE DATE

digital

FIELD CHANGE ORDER

FCO M7686 | S | 0005 — Level of Urgency (LOU)

STATUS / LOU	FCO EXPENSE RESPONSIBILITY: WARRANTY	CONTRACT	PER CALL
Mandatory	DIGITAL		
Required			
Specification			
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on-site) (Travel time not included)

0.5 DECIMAL HOURS

FCR- RM03
RM02
RJM02
RWM03

APPLICABILITY

REWORK ALL ETCH REVISION "C" M7686'S AT CS REVISION "E" OR EARLIER TO CS REVISION "F" WHEN SIX OR MORE RM02 OR RM03 DRIVES ARE DAISY-CHAINED.

THE MINIMUM ACCEPTABLE REVISION OF THE M7686 TO BE PHASED-IN TO SPARES STOCK IS CS "F"

QUICK CHECK (To determine if FCO has been installed)

WIRE ADD'ED FROM E2 PIN 1 TO E2 PIN 15

LAST PREVIOUS FCO s: NONE

RELATED OR PREREQUISITE FCO s / MCO s

M5922-S0001; M5923-S0001 70-13398-S-04

SPECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES (Not included in the Field Retrofit Kit)

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	☒ FCO ☐ PRINTS $10.00	NONE	

Parts charges are as of FCO release date and are subject to change.

PARTS AVAILABILITY DATE N/A

FIELD INSTALLATION and TEST PROCEDURE

SEE PAGE 2 OF THIS FCO

PRELIMINARY
This Copy Dated OCT 25 1978

LOGISTICS CODING (800) (0) (50)

LOGISTICS REVIEW

QTY PART NUMBER DESCRIPTION

ORDER BY THIS NUMBER	KIT INCLUDES FCO	PRINTS	PARTS
FA-04071-00	X		

NOTE: THERE IS ONE M7686 MODULE IN EACH RM02/RM03 DRIVE.

PROBLEM SYMPTOMS: PARITY ERRORS ON RM02/RM03 SYSTEMS CONTAINING SIX OR MORE DRIVES.

COMPATIBILITY NOTE: THE M7686 MUST BE AT ETCH REVISION "C", CS REVISION "F" OR LATER WHEN SIX OR MORE RM02/RM03 DRIVES ARE DAISY-CHAINED.

APPROVED - Field Service Product Support

GREG EKHOLM

DISTRIBUTION CODING

LIST 11-DECSYSTEM-20 | LKQ50

FCO RELEASE DATE

ENGINEERING CHANGE ORDER

ORIGINATOR: David Kelley	ECO NO.: M7686-ML006
TEL EXT: 3-3976 DATE: 11-8-78	SHEET 1 OF 2 DATE RECEIVED: 15 DEC 78
LOCATION: ML2-1 MAIL STOP: E5	FIRST ISSUE: 12/22/78
COST CENTER NO.: 3K5	FINAL ECO:

PROBLEM

1. Change in level of unit ready sets attention on Port A and Port B.

SYMPTOM

2. In dual port configuration software on locked out port receiver unaccountable attention.

M98ML3K5L9685

Item to be changed: M7686 control interface

Peripherals

Type of ECO Code: 2

CORRECTION

Rework M7686 logic so that change in level of unit ready causes attention as follows:

a. Set ATA A if not locked to Port B and
b. Set ATA B if not locked to Port A.

See rework instructions for details.

ECO CATEGORY: ☐ DECO ☐ DEPO ☐ HARDWARE ☐ SOFTWARE ☐ PURCHASE SPEC

BREAK-IN/EFFECTIVITY

Phase in at S. G. by upon receipt of first issue and M98 No.

NO EFFECT ON FIELD STOCK

FIELD SERVICE: AFFECTED Y ☑ N ☐ / FCO REQ. / FCO CODE: S

QUICK CHECK

RSC will do Q.C.

Where used: RM02, RM03

TEST

ITEM NO.	DOCUMENT/PART NO.	OLD REV	NEW REV	DESCRIPTION OF CHANGE/DISPOSITION OF MATERIAL
1.	F-DD-M7686-0	E	F	Update drawing rev letters (Its. 2-4) per this ECO.
2	D-CS-M7686-0-1	F	H	Update to show changes per this ECO.
3.	E-PL-M7686-0-[illegible]	F	H	Update parts list to show resistor changes.
4.	D-UA-M7686-0-0	F	H	Add rework instruction that's on sheet 2 of this ECO.

DOCUMENTATION AFFECTED: ☒ MODELS ☐ DIAGNOSTICS ☐ TECH PUBS ☐ TEST EQUIP. ☐ TEST PROG. ☐ [illegible] ☒ PKG INSTR. ☐ ENG SPEC. ☐ PURCHASE SPEC ☐ CONFIGURATION

APPROVAL SIGNATURE (TYPE NAME and SIGN)

ENGINEERING	Eugene Earlie *(signature)*	C.C. 3K5	EXT. 6486	DATE 11/16/78
MANUFACTURING	[illegible] *(signature)*	C.C. ADX	EXT. 369	DATE 12/5/78
FIELD SERVICE	[illegible] *(signature)*	C.C. 311	EXT. [illegible]	DATE 12/8/78
CHARGE NUMBER	FSE-[illegible]	OTHER	CAT. [illegible]	12/[illegible]/78

Coord. No.: 263293 | Ref. No.: MD

EN-0-0710-18-F277(3MC)

ENGINEERING CHANGE ORDER — CONTINUATION SHEET

ECO NO. M7686-ML006

SHEET 2 OF 2

ITEM NO.	DOCUMENT/PART NO.	OLD REV	NEW REV	DESCRIPTION OF CHANGE/DISPOSITION OF MATERIAL
5.	1302388	—	—	Res. 2K 1/4 w 5% Delete 1 (R52)
6.	1300447	—	—	Res. 4.7K 1/4 w 5% Delete 1 (R60)
7.	1300479	—	—	Res. 10K 1/4 w 5% Add 2 (R52, R60)

REWORK INSTRUCTIONS FOR M7686

REV B ETCH

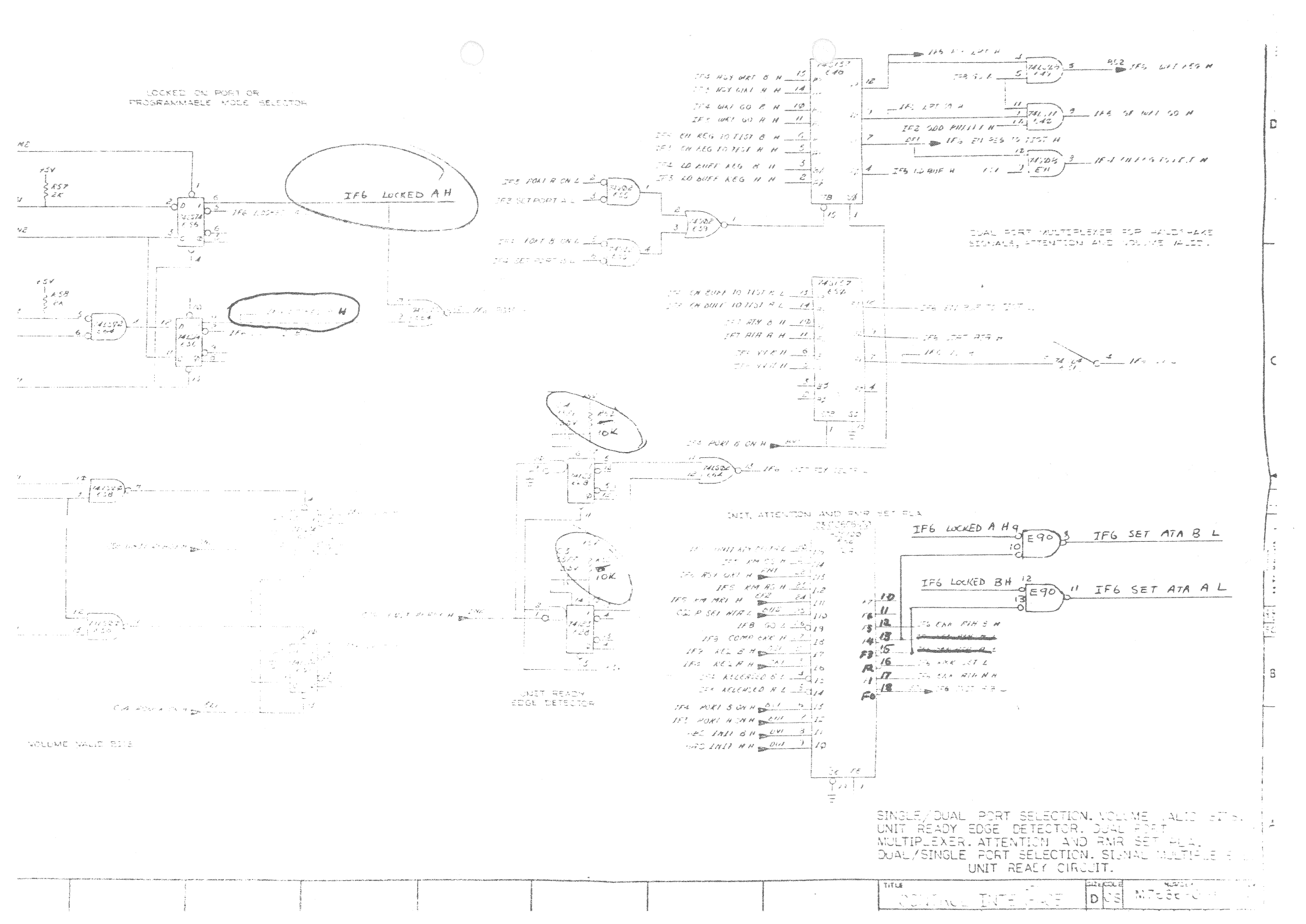
1. Remove wire from E69-3 to E62-13
2. Remove wire from E91-1 and insert wire into E90-13
3. Add a wire from E90-11 to E91-1
4. Add a wire from E90-12 to E64-9
5. Add a wire from E90-8 to E69-3
6. Add a wire from E90-9 to E64-8
7. Add a wire from E90-10 to E62-13
8. Change R52 from A 2K Res. to A 10K Res.
9. Change R60 from A 4.7K Res. to A 10K Res.

REV C ETCH

1. Cut etch on Side 2 from E91-1 to feedthru
2. Cut etch on Side 1 from E69-3 to feedthru
3. Add a wire from E90-11 to E91-1
4. Add a wire from E90-12 to E64-9
5. Add a wire from E90-13 to feedthru between filter cap. and E91-1
6. Add a wire from E90-8 to E69-3
7. Add a wire from E90-9 to E64-8
8. Add a wire from E90-10 to feedthru below E69-4
9. Change R52 from A 2K Res. to A 10K Res.
10. Change R60 from A 4.7K Res. to A 10K Res.

M7686-MLØØ6

EN-01071-18-18-R276(486)


LOCKED ON PORT OR
PROGRAMMABLE MODE SELECTOR
IF6 LOCKED A H
IF6 LOCKED B H
IF6 SET ATA B L
IF6 SET ATA A L
DUAL PORT MULTIPLEXER FOR HANDSHAKE SIGNALS, ATTENTION AND VOLUME VALID.
UNIT, ATTENTION AND RMR SET PLA
UNIT READY EDGE DETECTOR
VOLUME VALID BITS
SINGLE/DUAL PORT SELECTION. VOLUME VALID BITS.
UNIT READY EDGE DETECTOR. DUAL PORT
MULTIPLEXER. ATTENTION AND RMR SET PLA.
DUAL/SINGLE PORT SELECTION. SIGNAL MULTIPLE
UNIT READY CIRCUIT.

digital

FIELD CHANGE ORDER

FCO M5922 S 0001 — Level of Urgency (LOU) — PAGE 1 of 3

STATUS LOU	WARRANTY	CONTRACT	PER CALL
Mandatory	DIGITAL		
Required			
Specification			
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

FCO EXPENSE RESPONSIBILITY

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on-site) (Travel time not included)

1.0 EACH DRIVE
DECIMAL HOURS

FCR-RM02
RM03
RJM02
RWM03

APPLICABILITY

REWORK ALL ETCH REVISION "D" M5922'S AT CS REVISION "C" OR EARLIER TO CS REVISION "D" WHEN SIX OR MORE RM02/RM03 DRIVES ARE DAISY-CHAINED.

THE MINIMUM ACCEPTABLE REVISION OF THE M5922 TO BE PHASED-IN TO SPARES STOCK IS CS REVISION "D".

PRELIMINARY
This Copy Dated OCT 24 1978

QUICK CHECK (To determine if FCO has been installed)

IC 7414, 19-11324, IN LOCATION E6

LAST PREVIOUS FCO s NONE

RELATED OR PREREQUISITE FCO s / MCO s

M5923-S0001, M7686-S0005

SPECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES (Not included in FCO field kit)

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	☒ FCO ☐ NO PRINTS $10.00	$0.20	

Parts charges are as of FCO release date and are subject to change.

PARTS AVAILABILITY DATE DECEMBER 1978

LOGISTICS CODING (800) (50) (75)

LOGISTICS REVIEW [signature] 23 Oct 78

QTY	PART NUMBER	DESCRIPTION
2	19-11324	IC7414

ORDER BY THIS NUMBER	FCO	PRINTS	PARTS
EQ-00911-00	X		X
FA-04080-00	X		

(KIT INCLUDES: FCO, PRINTS, PARTS)

FIELD INSTALLATION and TEST PROCEDURE

1. REMOVE AND DISCARD E6 (IC 7404, 19-09686). INSTALL IC 7414, 19-11324, IN E6 LOCATION.
2. MARK THE BOARD AS A CS "D".
3. RUN APPROPRIATE MAINDEC PERFORMANCE EXERCISER.
4. MARK-UP THE SITE PARTS LIST DRAWING B-PL-M5922-0-0 AS FOLLOWS:

   DELETE QUANTITY 1, 19-09686. ADD QUANTITY 1, 19-11324.

PROBLEM SYMPTOMS: DIAGNOSTIC PROGRAM HALTS AND DRIVE DE-ASSIGNS DUE TO ERRONEOUS "NED" (NON-EXISTENT DRIVE).

COMPATIBILITY NOTE: THE M5922 MUST BE AT CS REVISION "D" OR LATER WHEN SIX OR MORE RM02/RM03 DRIVES ARE DAISY-CHAINED.

NOTES: THE EQ KIT CONTAINS PARTS TO REWORK TWO M5922'S (TWO M5922'S PER RM02/RM03 DRIVE).

APPROVED - Field Service Product Support

GREG EKHOLM

DISTRIBUTION CODING

LIST 11/DECSYSTEM 20/VAX

LKQ 75 ?c

FCO RELEASE DATE

digital

FIELD CHANGE ORDER

FCO M5923 | S | 0001 | PAGE 1 of 3

Level of Urgency (LOU)

STATUS / LOU	FCO EXPENSE RESPONSIBILITY		
	WARRANTY	CONTRACT	PER CALL
Mandatory	DIGITAL		
Required			
Specification			
Improvement			CUST
Hardware Option	PURCHASEABLE OPTION		
Cosmetic	CUST	CUST	CUST

On-site FCO installation, by DEC, will be in accordance with both APPLICABILITY and the above FCO EXPENSE RESPONSIBILITY matrix.

ESTIMATED TIME TO INSTALL and TEST (on-site) (Travel time not included)

1.0 EACH DRIVE

DECIMAL HOURS

FCR-RM02
RM03
RJM02
RWM03

APPLICABILITY

REWORK ALL ETCH REVISION "D" M5923'S AT CS REVISION "C" OR EARLIER TO CS REVISION "D" WHEN SIX OR MORE RM02/RM03 DRIVES ARE DAISY-CHAINED.

THE MINIMUM ACCEPTABLE REVISION OF THE M5923 TO BE PHASED-IN TO SPARES STOCK AS CS "D".

PRELIMINARY

This Copy Dated: OCT 24 78

QUICK CHECK (To determine if FCO has been installed)

IC 7414, 19-11324, IN LOCATION E6

LAST PREVIOUS FCO : NONE

RELATED OR PREREQUISITE FCO s / MCO s

M7686-S0005; M5922-S0001

SPECIAL TEST EQUIPMENT, TOOLS, or SUPPLIES (Not included in field kit)

FCO KIT CHARGES (United States and Canada only)

KIT ITEM	DOCUMENTATION	PARTS	OTHER
	☒ FCO ☐ PRINTS $10.00	$0.20	

Parts charges are as of FCO release date and are subject to change.

PARTS AVAILABILITY DATE: DECEMBER 1978

LOGISTICS CODING: (800) (50) (75)

LOGISTICS REVIEW: Lynn S Mine 23 Oct 78

QTY	PART NUMBER	DESCRIPTION
2	19-11324	7414 IC

FIELD INSTALLATION and TEST PROCEDURE

1. REMOVE AND DISCARD E6 (IC7404, 19-09686). INSTALL IC7414, 19-11324, IN E6 LOCATION.
2. MARK THE BOARD AS A CS "D".
3. RUN APPROPRIATE MAINDEC PERFORMANCE EXERCISER.
4. MARK-UP THE SITE PARTS LIST DRAWING B-PL-M5923-0-0 AS FOLLOWS:

   DELETE QUANTITY 1, 19-09686.
   ADD QUANTITY 1, 19-11324.

ORDER BY THIS NUMBER	KIT INCLUDES FCO	PRINTS	PARTS
EQ-00912-00	X		X
FA-04081-00	X		

PROBLEM SYMPTOMS: DIAGNOSTIC PROGRAM HALTS AND DRIVE DE-ASSIGNS DUE TO ERRONEOUS "NED" (NON-EXISTENT DRIVE).

COMPATIBILITY NOTE: THE M5923 MUST BE AT CS REVISION "D" OR LATER WHEN SIX OR MORE RM02/RM03 DRIVES ARE DAISY CHAINED.

NOTES: 1. THE M5923'S ARE THE "B" PORT RECEIVERS/TRANSMITTERS IN DUAL-PORT DRIVES.
2. THE EQ KIT CONTAINS PARTS TO REWORK TWO M5923'S (TWO M5923'S PER RM02/RM03 DRIVE).

APPROVED - Field Service Product Support

GREG EKHOLM

DISTRIBUTION CODING

LIST 11/DEC-SYSTEM-20/VAX

LKQ 75

FCO RELEASE DATE

DEC 12 (551)-1095A-A175

digital

FIELD SERVICE TECHNICAL MANUAL
NORTH EUROPEAN REGION

Option or Designator: RMO3

Applicable Countries	UK X	E X	N X	S X	D X	F X
12 bit	16 bit	18 bit	36 bit	CPL		

Title	Tech Tip Number
RMO3/O2 HINTS/TIPS	RMO3-TT-NE1

Processor Applicability	Originator	CC	Cross Reference
ALL	D. J. ARTHUR	79C	———
	Author D.J.ARTHUR		
	Reg. Approval ROBIN COLE R.T.Cole		
	Issue Date 30-JUNE-78	Rev 0	

1. With the flying height of RMO3 heads being only about 25 micro inches, CDC have found that any slight contamination left on the platters from pack cleaning is now more likely to cause head crashes. Because of this, and following the advice of CDC, customers should be recommended NOT to have their packs cleaned.

2. The only way in which RMO3 heads can be examined, is by removing them. Consequently, they MUST NOT be cleaned without removing them. Since PM proceedures do not include examination of heads, the only reason for inspecting them now, is if one suspects that they may be the cause of a problem.

3. The removal/replacement proceedure for heads as described in the manual should not be followed, since it refers to the extending of the heads into the pack area. It is not possible to do this without the heads touching, and once the heads have touched, it is essential that they are removed for inspection and cleaning. For removal and replacement, the heads should only be extended far enough such that it is possible to grasp them from the side. The heads should then be removed one by one from either the top or bottom (holding them on the sides) until the offending head is reached. They should be replaced by reversing this proceedure. Under no circumstances should the heads be allowed to touch.

4. It has been found, that one reason for head crashes, has been dirt on the carriage rails.

5. If when runing the drive down to change a pack, the heads are slightly protruding into the pack area such that the pack cover may damage them, then this is an indication that the Heads Loaded Switch is out of adjustment.

Continued/....

6. There are at present two vendors for the blower motor, and until a mod is available, these are not directly interchangeable. Thus if it is required to change one with the other, this turns what is normally a one man job into a two man job as this necessitates changing the shroud for the blower motor as well.

7. Due to the inaccessibility of the mounting screws for the run triac, the changing of it is a two man job. There is an ECO in the pipeline to overcome this, but this will not be reflected on the first drives in the field.

8. When looking at the IPB for the START and RUN triacs it will be found that they have different part numbers. They are electrically interchangeable, the difference is in the mounting.

9. When using the tester for reading and writing, the format that it uses differs greatly from that used by DEC systems. Thus for some types of fault you could well find it advantageous to have handy a pack already pre-formatted with that used by the tester, as well as one with the system format.

10. In some manuals bit 15 in Error Register 2 (776742) is shown as a 0. This should be shown as "BSE" (Bad Sector Error). Also, in the offset register, (776734) some manuals show the "OFF DIR" bit as being in bit 0 position, this should be in bit 7 position.

11. When using the RM02 on an 11/40 or 11/35 in 18 bit mode, it is necessary to cut W5 on the M7234 module.

12. When using a dual port RM02 on an RH11, it has been found that there is a problem with the MXF bit not setting.

digital

FIELD SERVICE TECHNICAL MANUAL
NORTH EUROPEAN REGION

Option or Designator: RMO3

Applicable Countries	UK X	E X	N X	S X	D X	F X

12 bit	16 bit	18 bit	36 bit	CPL X

Title	Tech Tip Number
RMO3 HEAD ALIGNMENT	RMO3-TT-NE2

Processor Applicability	Originator	CC	Cross Reference
ALL	D.J.ARTHUR	79C	———
	Author: D.J.ARTHUR		
	Reg. Approval: ROBIN COLE R.T.Cole		
	Issue Date: 30-JUNE-78	Rev 0	

The following points should be born in mind when carrying out head alignment.

1. Do not do continuous seeks over the head alignment cylinder, since the overheating of the platter/head due to this can make up to 150u" of difference.

2. Do not lean on the top of the RMO3 when carrying out alignment, as this can cause false readings.

3. There is at present a query on the head alignment figures quoted in the manual EK-1RMO3-TM-001 (RMO3 TECH MANUAL VOL 1). Until advised otherwise, I recommend using the following values:-

Page	Paragraph	Quoted Value	Use
2-31	Excessive Misalignment	300 mV	200 mV
2-32	12	150 mV	100 mV
2-34	22	75 mV	50 mV
2-35	33	110 mV	75 mV
2-35	33	75 mV	50 mV

4. When doing an RTZ, in order to tighten the heads, remember to remove the pin from the head alignment position. Failure to do so results in the blowing of one of the 6 amp fuzes on the 42 volt regulator.

5. When mounting/dismounting the CE pack ensure that label stuck on the periphery of the pack cover is not peeling off. It is possible that if it is, it could foul and damage the heads.

6. REMEMBER, when doing head alignment using the tester, that in order to be able to select heads, the maint/normal switch must be in the MAINT position. Also, do not forget to switch it back to normal after completing head alignment.

digital

INTEROFFICE MEMORANDUM

TO: Paul Fryatt PK3-2/S24
Rozsa Rozembersky PK3-2/S24
CC: John Gallagher MK1-2/E15
Larry Griswold PK3-2/H17
[redacted]

DATE: 3 MAY 79
FROM: Greg Ekholm
DEPT: Mass Storage Maintain Eng
EXT: 223-5068
LOC/MAIL STOP: PK3-2/H17

SUBJECT: RM02 SPINDLE ASSEMBLY

Recent events pointed out that the spindle assembly we are presently stocking for the RM02 and RM03 29-22900 CDC #75-074714 can only be used for the RM03.

A different spindle assembly CDC #75-074703 is required for the RM02. I am submitting a 29 class part number request today to correct this situation.

The 75-074714 spindle has a pulley diam of 1.88 inches and the 75-074703's diam is 2.56 inches. The pulley is part of the spindle assembly and we, therefore, must stock a new spindle assembly.

Your help in getting this new part into stock will be appreciated.