ATTACHE™

Technical Notes

SEPTEMBER 7, 1982

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ATTACHE TECHNICAL NOTES

September 7, 1982

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TECHNICAL NOTE INDEX

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TECHNICAL NOTE 8/20/82

Product: Attache 82:001

Supercedes: N/A

Subject: Deleting CP/M from the system tracks

CP/M may be removed from the system tracks by following the steps listed below.

1. Boot the system using a diskette containing CP/M.
2. Insert a blank formated scratch diskette in drive A.
3. Insert a system diskette with SYSDUP.COM in drive B.
4. Enter B:SYSDUP.
5. Insert the diskette to be updated into drive B.
6. Press the RETURN key.
7. Insert a system diskette with CP/M in drive A.
8. Enter N.

   Repeat for each diskette to be updated.

Test each diskette which has been updated by attempting to boot the system with it in drive A.

Note: CP/M has been removed but the space does not become available to the user.

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TECHNICAL NOTE   8/20/82

Product: Attache 82:002

Supercedes: N/A

Subject: EPSON Printer Set-Up

Interface Cards

8141 Serial Card @ 9600 BAUD		8145 Serial Card @ 960C BAUD		8145 Serial Card* @ 4800 BAUD	
1 on		1 on	1 on	1 off	1 off
2 on		2 off	2 on	2 on	2 on
3 off		3 off	3 off	3 off	3 off
4 off		4 off	4 on	4 off	4 on
5 off		5 on		5 on	
6 off		6 on		6 off	
7 off		7 on		7 on	
8 off		8 off		8 off	

Printers

MX-80		MX-80 w/graphics*		MX-100	
1 on	1 on	1 off	1 on	1 off	1 on
2 on	2 on	2 on	2 off	2 off	2 on
3 on	3 off	3 on	3 off	3 off	3 off
4 off	4 off	4 off	4 off	4 off	4 on
5 on		5 off		5 off	
6 on		6 on		6 off	
7 off		7 off		7 on	
8 on		8 on		8 on	

* Use the marked combination for graphics printing.

*yellow
See flagged page*

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TECHNICAL NOTE   8/20/82

Product: Attache 82:003

Supercedes: N/A

Subject: Electrostatic discharge protection for Attaches

Machine resets, loss of memory, and keyboard lockout usually occur as a result of discontinuity between the cabinet and the chassis of the Attache. Detailed below is the procedure for correcting this problem.

1. Turn the power off.
2. Detach the keyboard and set the unit face down on a flat surface.
3. Remove the four screws which attach the feet to the Attache.
4. Slide the cover off.
5. Apply masking tape over the power supply ventilation holes.
6. Remove all paint between the masking tape and the CRT frame.
7. Clean and mount the brass sticky fingers as shown.
8. Remove all paint from the area of the cover which will make contact with the brass sticky fingers.
9. Remove the masking tape and re-assemble the unit.

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TECHNICAL NOTE   8/20/82

Product: Attache 82:004

Supercedes: N/A

Subject: STD Bus Circuit Cards

Enclosed are specifications for STD BUS circuit cards. A short
list of manufacturers is also included. Please remember that any
such list is subject to change.

The STD BUS pinout is organized into five functional groups:

Logic Power Bus	Pins 1-6	Odd pins are on the
Data Bus	Pins 7-14	component side of the card.
Address Bus	Pins 15-30	
Control Bus	Pins 31-52	Even pins are on the
Auxiliary Power Bus	Pins 53-56	circuit side of the card.

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STD BUS Organization and Functional Specifications

Pin	Mnemonic	Description
1	+5V	+5 Volts DC (Bussed)
2	+5V	" "
3	GND	Digital Ground (Bussed)
4	GND	" "
5	-5V	-5 Volts DC
6	-5V	" "
7	D3	Low Order Data Bus
8	D7	High Order Data Bus
9	D2	Low Order Data Bus
10	D6	High Order Data Bus
11	D1	Low Order Data Bus
12	D5	High Order Data Bus
13	D0	Low Order Data Bus
14	D4	High Order Data Bus
15	A7	Low Order Address Bus
16	A15	High Order Address Bus
17	A6	Low Order Address Bus
18	A14	High Order Address Bus
19	A5	Low Order Address Bus
20	A13	High Order Address Bus
21	A4	Low Order Address Bus
22	A12	High Order Address Bus
23	A3	Low Order Address Bus
24	A11	High Order Address Bus
25	A2	Low Order Address Bus
26	A10	High Order Address Bus
27	A1	Low Order Address Bus
28	A9	High Order Address Bus
29	A0	Low Order Address Bus
30	A8	High Order Address Bus

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STD BUS Organization and Functional Specifications

Pin	Mnemonic	Description
31	WR	Write to Memory or I/O
32	RD	Read to Memory or I/O
33	IORQ	I/O Address Select
34	MEMRQ	Memory Address Select
35	IOEXP	I/O Expansion
36	MEMEX	Memory Expansion
37	REFRESH	Refresh Timing
38	MCSYNC	CPU Machine Cycle Sync
39	STATUS1	CPU Status
40	STATUS0	CPU Status
41	BUSAK	Bus Acknowledge
42	BUSRQ	Bus Request
43	INTAK	Interrupt Acknowledge
44	INTRQ	Interrupt Request
45	WAITRQ	Wait Request
46	NMIRQ	Non-Maskable Interrupt
47	SYSRESET	System Reset
48	PBRESET	Push Button Reset
49	CLOCK	Clock from Processor
50	CNTRL	AUX Timing
51	PCO	Priority Chain Out
52	PCI	Priority Chain In
53	AUX GND	AUX Ground (Bussed)
54	AUX GND	" "
55	AUX +V	AUX Positive (+12 Volts DC)
56	AUX -V	AUX Negative (-12 Volts DC)

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STD BUS CARD MANUFACTURERS

Advanced Micro Systems	
Amtek	Kennedy Company
Analog Devices	LDI Pneumatic
Antona	Matrix Corporation
Applied Micro Technology	Matrox Electronic Systems
Atec	Micro-Aide
Augat	Microcomputer Systems
Baradine Products	Micro-Link
BDS Microsystem Design	Micronet
Buckminster	Micro Source
Campbell Scientific	Micro/Sys Inc.
Circuits & Systems	Miller Technology
Contemporary Control Systems	Mimic Electronics
Cytec	Mostek
Data Translation	Mullen Computer Products
Datricon	PC/M Inc. Bubbl-Tec Div.
Designsmiths	Pro-Log
Digital Dynamics	Quasitronics
Douglas Electronics	Samco
Dy-4 Systems Inc.	Sensoray
E & L Instruments	Sibthorp Systems
Electrologic	Spurrier Peripherals
Enlode	Technitron
Enterprise Systems	Tetronics
Forethought Products	Transwave
Godbout Electronics	Vector Electronics
GW3 Inc.	Vero Electronics
I/O Controls	Ward Systems
Intermagnetics General	Whedco
Intersil	Xitex/QC Microsystems
Intra Computer	XYZ Electronics
JF Microsystems	Ziatech
Jonos Ltd.	Zydeco

The information in this technical note was taken from the
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TECHNICAL NOTE   8/20/82

Product: Attache 82:005

Supercedes: N/A

Subject: Alternate Character Sets

To access the Forms Ruling, Greek Lower and Upper Case
Characters, and Math Symbols, refer to Attache Programmer's Guide
III 6.

Select Character Set "ESC Tn", where n is the appropriate
character set.   Then use the enclosed character set translation
table. Select the ASCII character to display the appropriate
graphic character.

To change back to the standard ASCII character set "ESC Tn",
where n = 0, for Standard ASCII character set.

ALTERNATE CHARACTER SET TRANSLATION TABLE

```
@        -        ¿        ♂
A        ┤        ↕
B        ┘        ≚        ┘
C        ┐        △        ┐
D        ┌        ◀        ┘
E        ┴        ‡        ⌐
F        ┬        Γ
G        ├        θ        ↑
H        ─        ∂        ↑
I        ┼        ↓        ≦
J                 ↓        ≥
K        ┴        Δ        ∴
L        ┬        →        ∵
M        ┤        ∺
N
```

ALTERNATE CHARACTER SET TRANSLATION TABLE

```
O        ┴        Ū        ≈
P        ┬        Π        ≡
Q        ┤        ∙
R        ┼        Σ        ⌠
S        ┤        Γ        ⌡
T        ┼        Ω        ⌡
U        ┤        £        ↓
V        ┴        θ        ⌡
W        ─        Ø        ≥
X        ┼        ≀        ↓
Y        ┤        Ω        ≥
Z        ┤        Ā        ◦
[        ┼        Ū        ≠
\
]
```

ALTERNATE CHARACTER SET TRANSLATION TABLE

```
m        -        Ň        └
n        ·        Ō        ┴
o        ╱        π        ─
p        @        X        ─
q        1        ρ        ─
r        2        σ        ┼
s        3        τ        ┤
t        4        υ        ─
u        5        φ        ┤
v        6        ↓        ┤
w        7        ς        ┤
x        8        π
y        9        ↓        ┤
z        ·
{        ;        θ        π
```

ALTERNATE CHARACTER SET TRANSLATION TABLE

```
!        <        ≋        ≠
}        =        Ü        £
~        >        Ū        •
■        ■        ■        ■
```

ALTERNATE CHARACTER SET TRANSLATION TABLE

```
·        !        Ā        ≡
a        !        Ā        ±
b        ··       ì        ╫
c        ≠        α        ♦
d        ‡        β        ▒
e        ×        δ        ╤
f        ;        ε        ▶
g        ,        ·        ╤
h        (        θ        ±
i        )        σ        ╝
j        *        θ        ╪
k        +        ι        ┘
l        ·        2        ┐
         ·        κ
                  λ        ┌
```

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TECHNICAL NOTE   8/20/82

Product: Attache 82:006

Supercedes: N/A

Subject: MBASIC Serial Port Access

Attached is a MBASIC dumb terminal emulation program, for demonstration purposes only.

Please note that an MBASIC program is interpreted which means that meaningfull communication can only take place at approximately 300 BAUD. The techniques illustrated here should enable one to interface to plotters, digitizers, and other similar devices.

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```
10  REM  *****************************************************************
20  REM  *
30  REM  *  Name: TERMINAL
40  REM  *  Rev.: 1.0
50  REM  *  Date: August 3, 1982
60  REM  *
70  REM  *  Desc: Emulate a 300 BAUD Dumb Terminal in MBASIC
80  REM  *
90  REM  *****************************************************************
100 RBF% = 1 :          REM   Receive Buffer Full Mask
110 TBE% = 4 :          REM   Transmit Buffer Empty Mask
120 INQUIRY% = 16 : REM   Z80 SIO Status Request Command
130 DAT% = 240 :        REM   Comm. Data I/O Port
140 STATUS% = 241 : REM   Comm. Status I/O Port
150 REM
160 REM   Check for incoming character, echo and display
170 REM
180 OUT STATUS%,INQUIRY% : CHECK% = INP(STATUS%)
190 IF (CHECK% AND RBF%) = 0 THEN GOTO 240
200 CHAR% = INP(DAT%) : GOSUB 290
210 REM
220 REM   Check for keyboard key pressed, transmit, and display
230 REM
240 CHAR$ = INKEY$
250 IF CHAR$ = "" THEN GOTO 180
260 CHAR% = ASC(CHAR$)
270 IF CHAR% = 27 THEN SYSTEM
280 GOSUB 290 : GOTO 180
290 REM
300 REM   Transmit and display character
310 REM
320 OUT STATUS%,INQUIRY% : CHECK% = INP(STATUS%)
330 IF (CHECK% AND TBE%) = 0 THEN GOTO 320
340 PRINT CHR$(CHAR%); : OUT DAT%,CHAR%
350 RETURN
```

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TECHNICAL NOTE   8/20/82

Product: Attache 82:007

Supercedes: N/A

Subject: CP/M IOBYTE Implementation

The CP/M STAT command may be used to change the physical to logical device assignment of the system. Refer to your CP/M guide for information on the syntax of this command. Outlined below is the ATTACHE implementation of system devices.

CP/M Device	Logical Device	Physical Device
LST:	TTY:	Comm. Port
	CRT:	Internal CRT
	LPT:	Printer Port
	UL1:	Printer Port
PUN:	TTY:	Comm. Port
	PTP:	Internal CRT
	UP1:	Printer Port
	UP2:	Comm. Port
RDR:	TTY:	Comm. Port
	PTR:	Printer Port
	UR1:	Internal CRT
	UR2:	Comm. Port
CON:	TTY:	Comm. Port
	CRT:	Internal CRT
	BAT:	Printer Port
	UC1:	Internal CRT

Intial Values:

```
LST:=LPT:
PUN:=TTY:
RDR:=TTY:
CON:=CRT:
```

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TECHNICAL NOTE   8/20/82

Product: Attache 82:008

Supercedes: N/A

Subject: MBASIC Graphics Escape Useage

Several users have observed the following difficulty when using
escape codes to generate graphics from a MBASIC program:

> When multiple points/vectors have been plotted an erroneous
> point may appear on the screen. The cursor also may move
> although no statements that would normally cause it to have
> been executed. Using a WIDTH 255 statement has no effect.

Please note the following for your future reference.

1. This problem only occurs within MBASIC.
2. This problem does not occur when GRAPH and PLOT statements
    are used instead of escape code sequences.
    (i.e. the next release of CP/M and MBASIC)
3. The standard distrubution CP/M (i.e. 2.2) does not implement
    clear screen separate from disable graphics.

The correct procedure for initializing graphics using CP/M 2.2:

```
PRINT CHR$(27);"6"; : REM  Disable and clear graphics
PRINT CHR$(27);"7"; : REM  Enable graphics
```

The following escape codes are the only ones present in CP/M 2.2:

```
ESC 0xxyy          Plot point       (xx & yy base 64)
ESC 1xxyy          Plot vector      (xx & yy base 64)
ESC 6              Clear & disable graphic image
ESC 7              Enable graphic image
ESC 8              Set plot point/vector mode
ESC 9              Set erase point/vector mode
```

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TECHNICAL NOTE   9/3/82

Product: Attache 82:009

Supercedes: N/A

Subject: "Z" Test - Diskette Drive Diagnostic

The "Z" test is used to verify the performance of **both the drive
and the diskette**. It is not practical to test either as an
individual item.

In viewing the results of the test, any failures, or apparent
failures, are associated with the both the drive and diskette.
Always suspect the diskette as the failed item first and the
drive second.

"Z" Test instructions

The full instructions for performing the "Z" test and the asso-
ciated error messages are detailed in the Attache Technical
Manual.

Any and all errors occuring during the test must be recorded.
Otrona cannot provide support or authorize any repairs without
these results. (Must use specified media - see below)

Test Media

The **only** acceptable media for performing the "Z" test is new,
unused, Dysan 104/2D diskettes. Otrona will not accept _any_
reported errors for support or repair performed with any other
media.

1

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Soft Errors

The manufacturers of diskettes specify that soft errors may and will occur. A soft error is one that may occur on a periodic or random basis but the data can be read with retries.

The "Z" test is extremely rigorous and does not allow for soft errors. You can determine if an error in the "Z" test is a soft error by entering the following command:

        L U _ _ _ _ V   Where _ _ _ _ is the cchs value from
                        the "Z" test error message.

If the specified sector is read successfully by the above test, then the error was a soft error and the drive is operating correctly.

An alternate and recommended procedure is to rerun the Z test on a second piece of media. Look for the occurrence of the same error.

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TECHNICAL NOTE   8/20/82

Product: Attache 82:010

Supercedes: N/A

Subject: Axiom IMP MiniPrinter Set-Up

The Axiom IMP Miniprinter should be set as follows for graphics printing at 1200 BAUD:

1 on	1 on
2 on	2 on
3 on	3 on
4 off	4 on
5 off	5 on
6 off	6 on
7 on	7 on
8 on	8 off
	9 on
	10 off

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TECHNICAL NOTE   8/30/82

Product: Attache 82:011

Supercedes: N/A

Subject: C. Itoh 8510A Printer Set-Up

Interface Card

S21	S22	S23	S24
1 open	1 open	1 closed	1 closed
2 closed	2 open	2 open	2 open
3 open	3 open	3 open	3 open
4 closed	4 open	4 open	4 closed
5 open		5 closed	5 closed
6 open		6 open	6 open
7 open			7 open
8 open			8 closed

Printer

S1	S2
1 open	1 closed
2 closed	2 open
3 open	3 open
4 open	4 open
5 open	5 open
6 open	6 closed
7 closed	7 open
8 open	8 open

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TECHNICAL NOTE   8/19/82

Product: Attache 82:012

Supercedes: N/A

Subject: Softcom with the Xerox 820

The Xerox 820 Port A must be initialized before Softcom can be
used for data transfers. The short assembly language program
listed below may be used for this purpose.


```
BAUDA      EQU  0          ; I/O Port for setting BAUD rate
CMDA       EQU  6          ; I/O Port for commands to channel A
RATEA      EQU  7          ; BAUD Rate value (consult Xerox manual)
;
           ORG  0100H      ; CP/M TPA
;
           MVI  A,018H     ; channel reset
           OUT  CMDA
;
           MVI  A,1        ; point to register 1
           OUT  CMDA
           MVI  A,0        ; no interrupts
           OUT  CMDA
;
           MVI  A,3        ; point to register 3
           OUT  CMDA
           MVI  A,0C1H     ; Rx enable, Rx 8 bits/character
           OUT  CMDA
;
           MVI  A,4        ; point to register 4
           OUT  CMDA
           MVI  A,044H     ; no parity, 1 stop bit, x16 clock
           OUT  CMDA
;
           MVI  A,5        ; point to register 5
           OUT  CMDA
           MVI  A,0E8H     ; Tx enable, 8 bits/character, DTR on
           OUT  CMDA
;
           RET             ; return to CP/M CCP
           END
```

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TECHNICAL NOTE   8/20/82

Product: Attache 82:013

Supercedes: N/A

Subject: CRT Alignment Procedure

Due to a change in process software, some internal CRT monitors may not be electrically centered properly. When replacing a CRT module, the following procedure should be followed to insure correct alignment.

1) Remove the rear feet of the computer.
2) Place the computer standing with the front bezel on a table. Remove the outer skin by pulling straight up.
3) Remove the CRT module by unscrewing the six mounting screws, unplugging the signal cable, and lifting up and out.
4) Place the computer as if you were going to operate it.
5) Place a non-conductive prop underneath the front bezel so as not to short out any pins on the CPU board.
6) Place CRT module to the right of the machine, and plug the signal cable into position. Place the CRT module so that you have easy access to the yoke assembly. See the attached drawing for identification.
7) Connect a ground strap between the chassis of the computer and the chassis of the CRT frame.
8) Connect the keyboard to the computer.
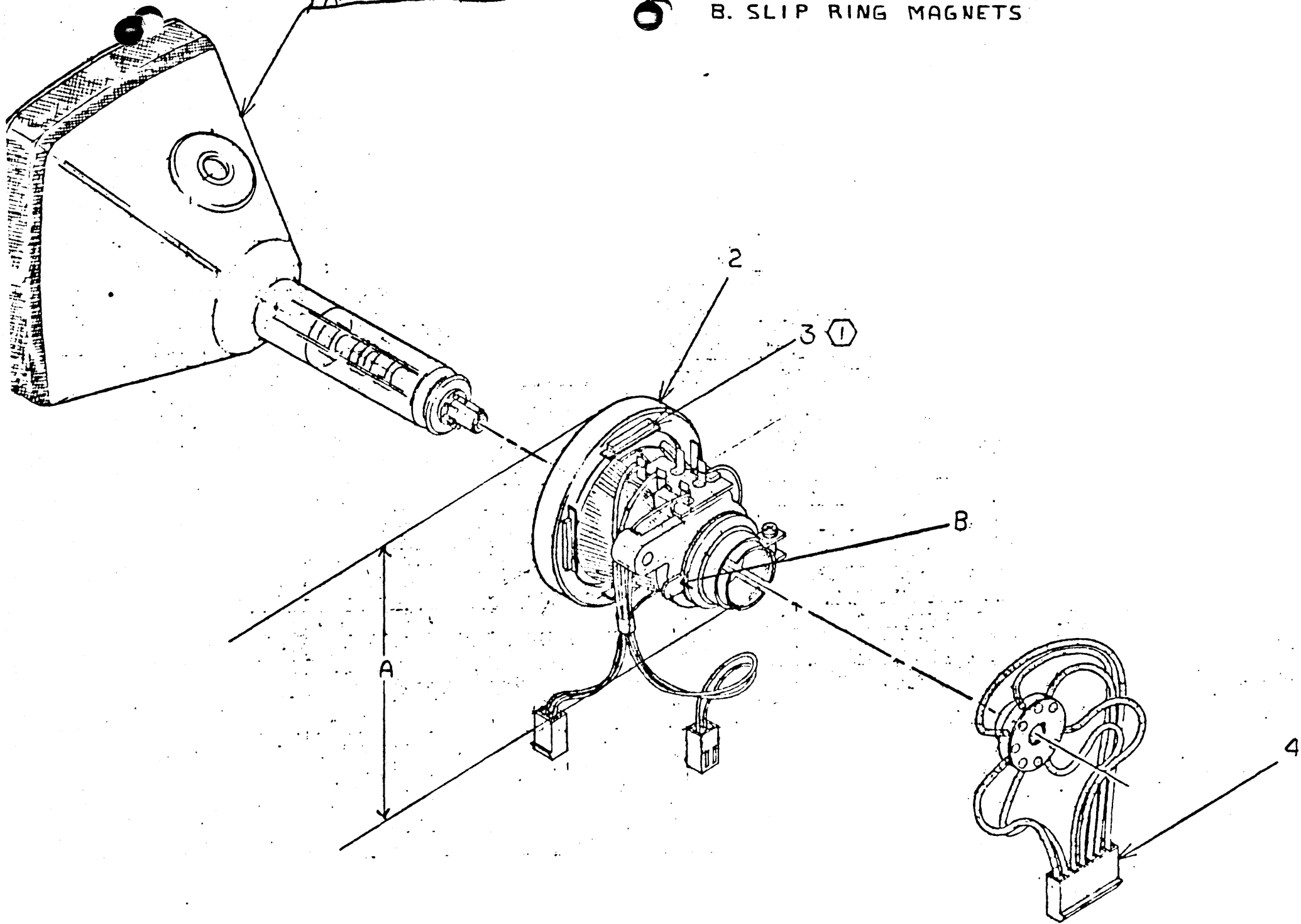9) Check that all components are not shorting against any conductive surface.

*** CAUTION ***

High voltage will be present on the yoke and the anode of the CRT when power is applied. Make sure your body is not grounded at any point during the adjustment procedure.

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10) Connect the power cord to the computer.
11) Turn the computer on.
12) Verify that the computer is in terminal emulation mode.
13) Pass control to the monitor by depressing CTRL and LINE FEED.
14) After the @ appears press the G key to get the screen align-
    ment pattern.
15) Inspect the pattern displayed on the CRT for proper centering.
16) Being carefull not to touch any other part of the yoke assembly,
    adjust the two slip ring magnets until the pattern is centered.
    Refer to the drawing for the location of the slip rings.

17) At this point all adjustments should be complete. Turn the
    computer off and reassemble in reverse order of teardown.
18) Verify that the pattern is centered on the screen prior to the
    installation of the outer skin. If the screen is not centered,
    repeat the above procedure until satisfactory results are
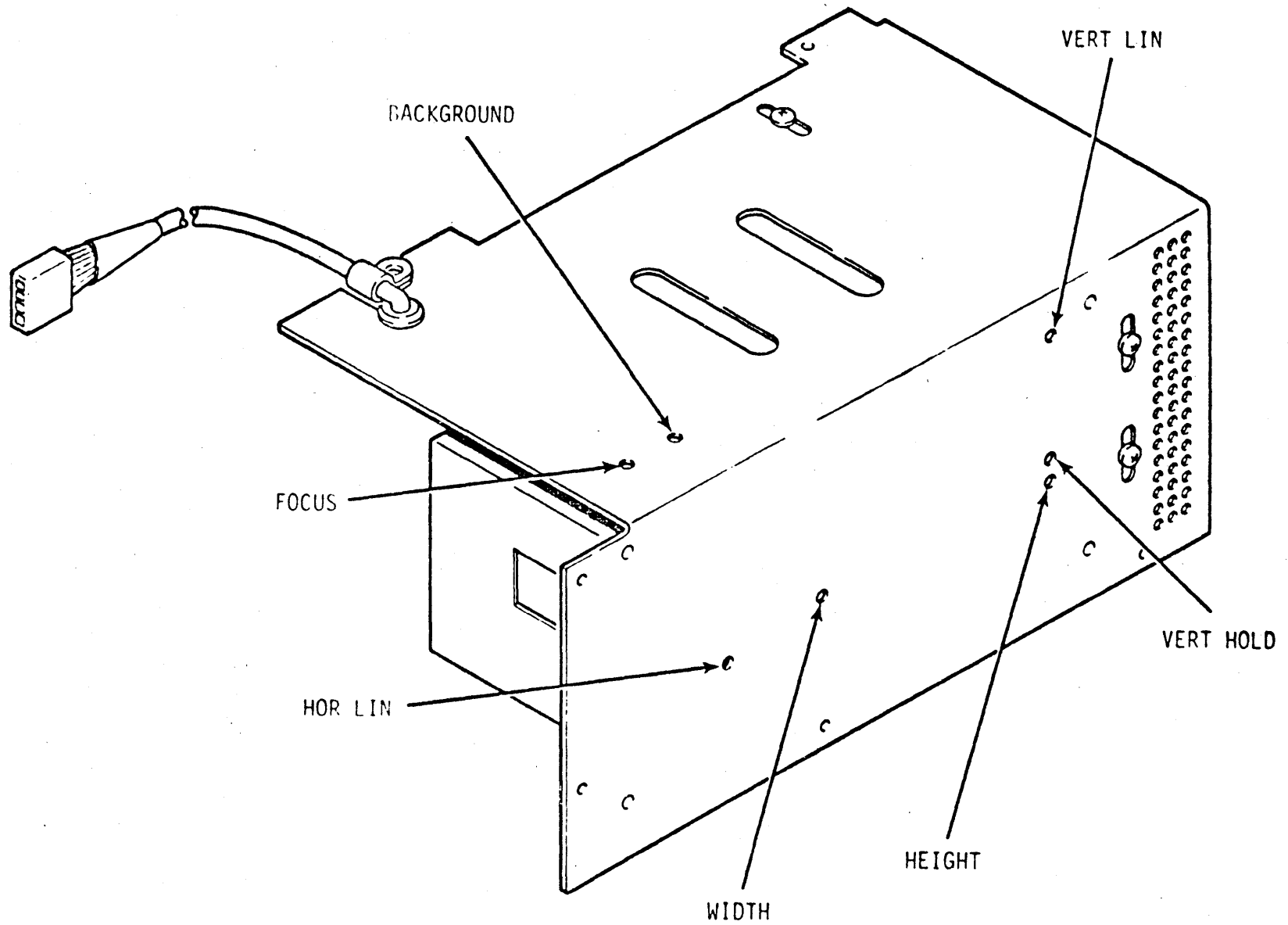   achieved.

Anode High Voltage

A. YOKE ASSEMBLY
B. SLIP RING MAGNETS

2

3 ①

A

B

4

CRT ALIGNMENT / ADJUSTMENT