PG Design Electronics Inc.
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Instruction Manual For Installation Of 32K
CMOS Expansion Ram for
TRS 80 Model 100 Portable Computer *

CAUTION:
Do not remove your Memory Module from
protective foam packing until you are ready
to insert Memory Module into your Model 100
Computer.
The 32k CMOS Ram Memory Module you have
purchased is designed to use very low power
CMOS components. Because CMOS Components are
very low power devices they can be damaged by
the energy present in Static Electricity.
Please use the necessary precautions when
handling your CMOS Component.

* TRS-80 is a Trademark of the Tandy Corp.

Patent Pending

Rev 1.0   (1)

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Statement Of Limited Warranty

PG Design Electronics, Inc. Warrants that its products will be free from defects in materials and workmanship for a period of 180 days from date of shipment. PG Design Electronics, Inc. will repair or replace, at its option any equipment or parts that PG Design Electronics, Inc. determines were defective when shipped by us.

If service is required under this warranty, the customer must: (1) Notify PG Design in writing or by telephone of the defect; (2) Obtain a return authorization (RA) number from PG Design which must be shown on the outside of all shipping containers and in all correspondence; and (3) send the product to PG Design delivery charges prepaid unless otherwise directed by PG Design. In making repairs, PG Design will replace parts as required on an exchange basis. PG Design Electronics,Inc. reserves the right to alter the appearance or physical parameters of the product or to change its manner of functioning without notice to the customer. After repair PG Design Electronics, Inc. will prepay return delivery charges.

This limited warranty does not cover losses or damage which occur due to, but not limited to; (1) shipment to or from customer; (2) neglect, misuse or any cause other than ordinary use;(3) Adjustment, repair, or modifications by other than PG Design Electronics, Inc. authorized personnel;

(4) improper enviromental factors such as excessive or inadequate heating or air conditioning, and electrical power failures, surges, or other irregularities; (5) other causes beyond the control of PG Design Electronics, Inc. including but not limited to natural causes or disasters, wars, insurrections, civil disturbances, labor disputes, or the requirements of domestic or foreign governments; (6) shortages or allocation of materials, utilities or other resources.

PG Design Electronics, Inc. does not warrant that its products are merchantable or fit for any particular purpose whatsoever. This limited warranty is in lieu of all other warranties, express, implied, or statutory.

PG Design Electronics, Inc's liability, whether based on contract, tort, warranty,strict liability, or any other theory, shall not exceed the price of the individual product whose defect or damage is the basis of the claim. in no event shall PG Design Electronics, Inc. be liable for any loss of profits, loss of use of facilities or equipment, or other indirect, incidental, or consequential damages. The foregoing limited warranty is the exclusive remedy provided to our customers.

Specifications:

Dimension:

            Length: 2.25 in.
            Width: 3.00 in.
            Height: .50 in.

Weight: 1.5 oz.

Memory: 32,768 X 8 Bit CMOS Ram

Electrical:

            Voltage: 5v +- 10%
            Operating Current: 6 to 10 ma
            Standby Current: 10 to 40 ua

Batteries:

            Type: 2 #389 Silver oxide 1.5 volt
            Life: 3 to 6 Months

Battery Replacement Time: 30 Seconds

Installation of 32K CMOS RAM Memory Module

(1) Turn Computer "OFF" This is the switch on the right hand side of the machine as you are looking at the screen.
"Memory Power" switch which is located on the underside of the machine does not have to be turned "OFF".

(2) Remove Expansion Buss Cavity Compartment Cover. This is located on the underside of your Computer. Ref. Figure (1).

(3) Remove any adaptor sockets from Expansion Buss e.g. Disk Video Interface Adaptor etc.

(4) Remove 32K Expansion Ram from carrying case. NOTE: 32K Expansion Ram is a CMOS device and is very susceptible to static discharge. Be certain not to build up charge within yourself by walking on carpeting prior to removal of your 32K Ram Expansion Module from case it is suggested that you discharge static build up from yourself by (grabbing metal door handle, metal desk knob, or metal lock, etc. etc. etc.).

(5) Check all pins on underside of 32K Ram to ascertain their straightness. Then place 32K Ram into Expansion Buss Cavity with pins & batteries facing towards inside of Computer. After pins drop into Buss holes firmly press 32K Ram into place.

(6) Re-install Expansion Compartment Cover.

(7) Turn Computer over and turn power switch "ON". Computer will power up in the first or original bank. If display does not turn on, turn power "OFF" at once. Refer to removal instructions to check Ram for bent pins or improper seating of 32K expansion Ram.

(8) Refer to " Bank Select Program" to select second bank.
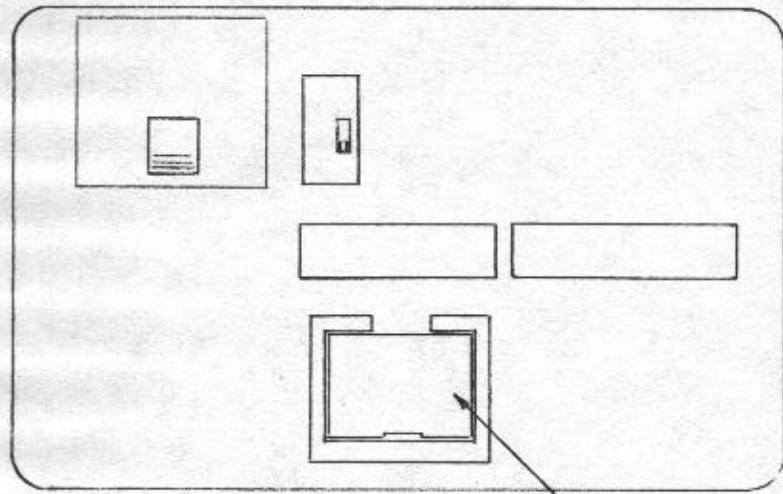
EXPANSION BUSS CAVITY

Figure (1)

Removal of 32K Expansion Ram from Computer.

(1) 32K Module retains memory when removed from Computer.

(2) Turn Power "OFF".

(3) Turn Computer over so that its face is in downward position.
You will be looking at the underside of Computer after doing this.

(4) Remove Expansion Buss Compartment Cover .

(5) Refer Figure (2)

(6) Usea "Dime" as shown in figure (2) to lift 32K Expansion Ram From Cavity.
Start at one side of Ram and stick dime between cavity wall and edge of Expansion Ram as shown in figure . Pry up gently. Repeat operation on the opposite side of Ram. Alternate this procedure until Ram is free from pin holes. Pry only in area as indicated by arrows in figure . This procedure will insure that pins in 32K Ram will not be bent.

(7)
Replace 32K Ram into carrying case to prevent bending of pins.

Insert dime at points indicated by arrowheads
and gently pry-up. Alternate this procedure
from side to side to free the 32k RAM from
buss pins.

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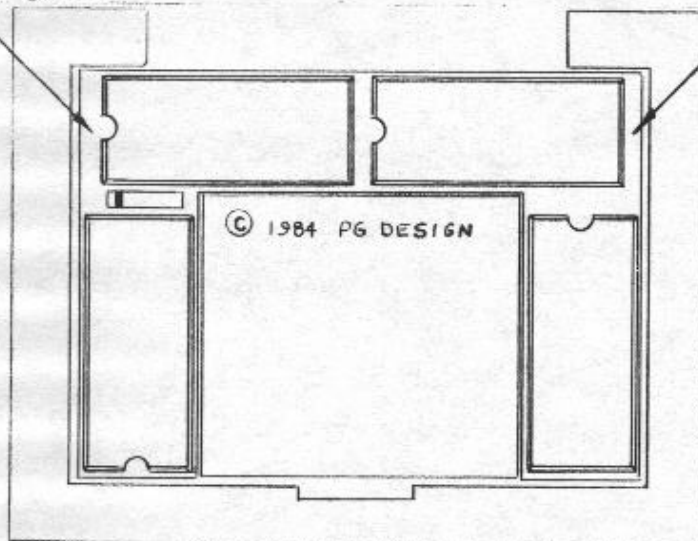
40 Pin Buss Cavity on the underside of the
Computer shown with the cover plate removed.

Figure (2)

" Bank Select Program"

(1) Turn Computer "ON".

(2) Go to "BASIC".

(3) Type in program as shown in line 4.

(4) 10 A$="":B=VARPTR(A$):POKE B,211:POKE
        B+1,128:POKE B+2,199:CALL B

(5) Save this program using a name which will
remind you of what Bank you are in when you
return to MENU.
We suggest save "Bank 0.BA" for original Ram.

(6) Return to Menu. Function key 8. Position
cursor to "Bank 0.BA" or the program name you
selected as you saved the program in line
5. Press enter key. Computer will switch
to other Bank. If SN Error occurs check
program in line (4) to make sure typing
is correct.

(7) The second Bank will come up with three
 files in addition to Basic, Text, Telcom,
Addrss, Schedl. These programs are named
"Batt.Do", "Bank 1.BA", and Test.BA.

Bytes free should be (   ).
If these files are not present, memory has
been lost during shipping. The Bank switch
program must be typed into the second bank.
Follow instructions 2 thru 6 to install the
bank program in to the second bank. Save
program as "BANK 1.BA".

(8) Batt.Do File is a text file to remind you
when you installed the batteries. e.g. (Date
installed 03/10/84).

(9) Test.BA is a test program to test new
bank. Refer (TEST PROGRAM).

```
10 CLS:PRINT"Starting Ram Test"
20 CLEAR 1000,MAXRAM
30 IF MAXRAM <> 62960 THEN PRINT "Something
   Has Changed Maxram This Program will not
   Run":END
40 FOR A= 62001 TO 62093
50 READ B
60 B1=B1+B
70 POKE A,B
80 NEXT A
90 IF B1=11093 THEN 110
100 PRINT"DATA Statements are wrong":PRINT"
    Program Will not Run Unless Corrected":
    END
110 FOR H=32*1024 TO 64*1024 STEP 256
120 IF H=65536 THEN H=H-1
130 IF H=61952 THEN H=H+256
140 PRINT"Testing Ram Byte "H;:PRINTCHR$(13);
150 CALL 62001,0,H
160 IF PEEK(62094)><0 THEN 170 ELSE 180
170 PRINT"Ram Failed At Byte ";:PRINT(PEEK
    (62095)*256)+PEEK(62096):PRINT"BAD RAM":
    END
180 NEXT H:PRINT:PRINT"GOOD RAM"
190 END
200 DATA 243,245,197,213,229,0,0,0,17,129,242,
    70,26,254,254,202,77,242,119,78,185
210 DATA 194,110,242,19,195,61,242,112,35,124,
    181,202,102,242,62,0,189,194,57,242,0,0,0
220 DATA 0,0,0,0,0,0,0,0,0,62,0,50,142,242,
    195,123,242,62,255,50,142,242,124,50,143,
    242,125,50,144,242,225,209,193,241,251,201
230 DATA 0,1,2,4,8,16,32,64,128,255,85,170,254
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BATTERY REPLACEMENT:

(1) 32K Ram Module must be removed from Computer as per Installation and removal instructions. Batteries should be replaced every three to six months. No warranty is given or implied on batteries.

(2) It is highly suggested to back-up all programs loaded into your 32K Ram Module prior to battery replacement. There is a distinct possibility of installing a "bad" battery. If this happens all programs on your 32K Ram Module will be lost.There is a 30 second built-in charge in your 32K Ram to allow for removal and replacement of batteries. Remove and replace (1) one battery at a time. Reason for removimg and replacing one battery at a time is the regeneration of the 30 second charge built into 32K Ram Module. IMPORTANT: If this period of time, 30 seconds, is extended you will lose all memory in your 32K Ram Module.

(3) Batteries are NO# 389, 1.5 volt. Watch and calculator batteries. Use of any other battery will void all warranties on your 32K CMOS RAM.

(4) Replace batteries as per figure (3).

(5) If Memory is lost due to unforseen circumstances please reinstall 32K RAM MODULE INTO COMPUTER AND REPLACE COVER PLATE.Turn Computer over so that it is face-up and turn Computer "ON".Follow ·instructions in Bank Select Program, section, Line (8) to reinstall Bank Select Program. After this is done you must type in new Batt.Do file to remind yourself when batteries were installed.

BATTERY REPLACEMENT:
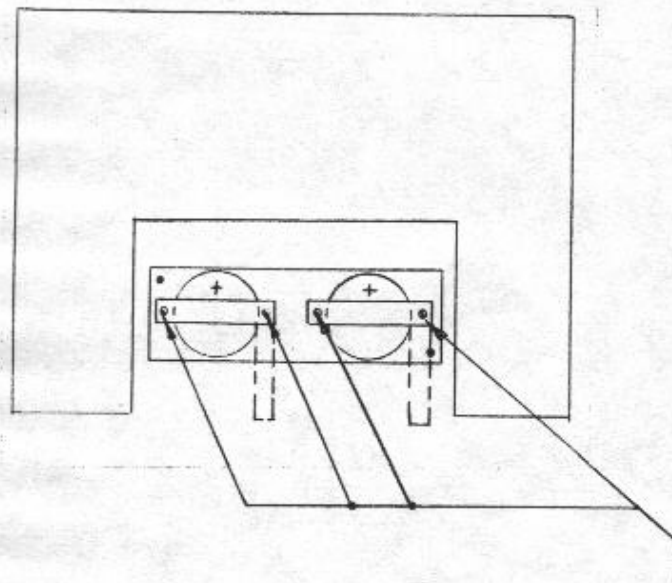
To remove the battery, loosen both screws
rotate clip down until battery is free.
Insert NEW battery + POSITIVE side UP.
Tighten screws,repeat process for other
battery. Battery must be re-installed within
30 seconds or risk of loss of memory is
possible.

Figure (3)