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Bob;

Here is a little gem for dedicated Arcadians to try on those home-brew games with 115 cells of storage left in them:

```

10 A=20180;B=A;C=100
20 X=-43;GOSUB C
30 X=12341;GOSUB C
40 X=19480;GOSUB C
50 X=3164;GOSUB C
60 X=-13871;GOSUB C
70 CALL(B);STOP
100 %(A)=X;A=A+2;RETURN

```

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The above BASIC statements store a very short machine-language routine in memory and execute it. The memory area used is the Keypad input buffer. It may not work on all versions of the ARCADE, since the absolute memory address of the message to be displayed is coded into it and, as we have seen, BALLY has at least two versions of the on-board software in the field.

For those interested, the following is a listing of the routine:

4ED4:	D5	PUSH	DE	Save BASIC pointer
4ED5:	FF	RST	38H	Call subroutine
4ED6:	35	DB	53	SR no. 52, load regs.
4ED7:	30	DB	48	Horizontal screen position
4ED8:	18	DB	24	Vertical screen position
4ED9:	4C	DB	1140	Color and size
4EDA:	5C 0C	DW	0C5CH	Adrs of message to display
4EDB:	D1	POP	DE	Restore BASIC pointer
4EDC:	C9	RET		Go back to BASIC

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The strange decimal numbers used in the BASIC statements arise due to an idiosyncrasy of 8080/Z80 Microprocessors and the way BALLY BASIC handles integers. BALLY BASIC uses 15 bit signed integers and stores data into memory with the least significant 8 bits going into the lowest numbered memory location. With these two things in mind we can see that machine-level routines must be POKEd into memory 2 bytes at a time, after reversing the bytes and converting to decimal. As an example, consider the first two bytes of the above routine (D5 and FF). The order of these two bytes must be reversed, the two bytes considered as one signed integer and converted to decimal. Thus FFD5 becomes -43 decimal and shows up as line 20 in the BASIC language routine. Continuing,

```

3035 = 12341
4C18 = 19480
0C5C = 3164
C9D1 = -13871 (C = 1100 which has the sign bit set)

```



If the newer ARCADES on-board software is consistently off by 5 and you don't get the right message, try changing line 50 to X=3169.

Good Luck!

Tom Wood