

done

APPLICATIONS PROGRAMMING ENTERPRISE

P.O. BOX 186 • LEE'S SUMMIT, MO. 64063 • [816] 525-2735

George M. Hale/Owner



February 14, 1979

Robert Fabris
 Arcadian
 3626 Morrie Dr.
 San Jose, CA 95127

For those like myself who just have to see what is inside their Bally basic unit I am offering a set of take-apart instructions that will include four color prints of the unit in various stages of disassembly. Price \$15

} no.

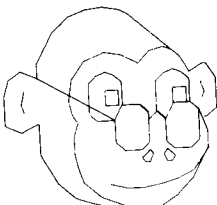
I have partial pin-out information on the circuit board, and it is illustrated below. This information can be considered only tentative and subject to confirmation by Bally. I obtained this info by visual inspection of the circuit board and by circuit tracing with an ohmmeter set on a high resistance range. I do not recommend anyone else doing this unless he really knows his electronics. Bally has hidden a lot of circuit paths under its chips so that a visual inspection of the board alone will not do a lot of good. With a pin-out diagram of the Z80 CPU you can see that all of the Z80 lines seem to be present at the 50-pin rear connector.

Counting the cassette ROM pin-out, there are six of various sizes on the circuit board.

The RAMS in my unit had no identification marks. The internal ROMS are copyrighted by Bally, as are their cassette ROMS. The cassette ROM seems to be a pin-out configuration like a National Semiconductor DM85S28 ROM. If indeed the ROM is this type then pins # 18, 19, 20, 21 in my diagram are the enable signals E4, E3, net-E2, net-E1. In this case, the cassette ROM is enabled when a high exists on E4 and E3 and a low exists on net-E2 and net-E1. Since lines 18, 19, and 21 seem to be tied to address lines A11, A10, A12, it would seem that these ROMS are addressed and data read out when A10=A11=1 and A12=0 and the CPU pulls down pin 20 to a low state. Under any other conditions the data lines exist in a high impedance state. This would be a 1024-byte ROM. All of this is still subject to confirmation by Bally. I made no tests with power on, for I don't have the proper equipment for such tests.

The net-RD, net-WR, net-MREQ, net-IOREQ, net-M1, and net-RFSH signals pass through a Tri-State buffer prior to their terminal ends on the 50-pin connector.

(continued next page)



SOFTWARE

ELECTRONICS

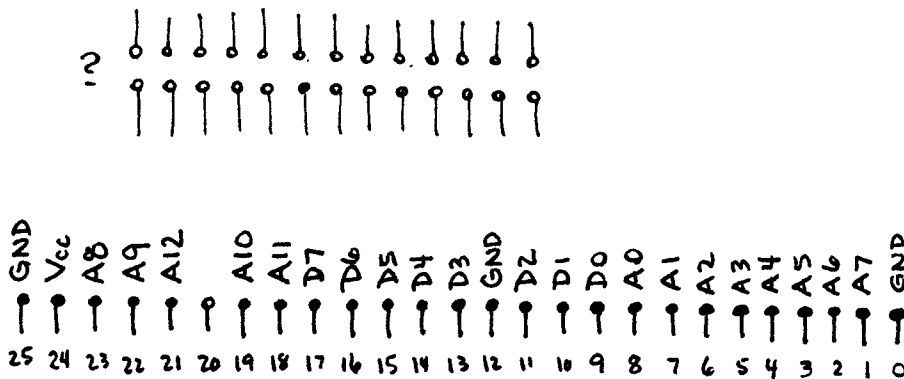
I show the net-BUSAK signal as (positive) BUSAK because it appears to go through a hex-inverter chip before coming to the terminal.

I have no information on the buffers connected with other signals on the 50-pin terminal, though some of the pins do not seem to be buffered at all.

And I wasn't able to determine a Vcc +5V pin on the 50-pin rear connector, though it's probably there. I don't think one should expect the unit to deliver power to an external device anyway.

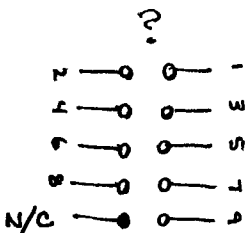
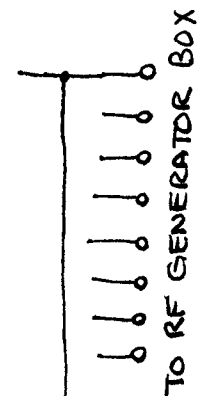
In my diagrams, pins with tails facing into the page are terminal pins on the top side of the circuit board, and pins with tails facing out to the edges of the page are terminal pins on the underside of the circuit board.

FRONT OF BOARD

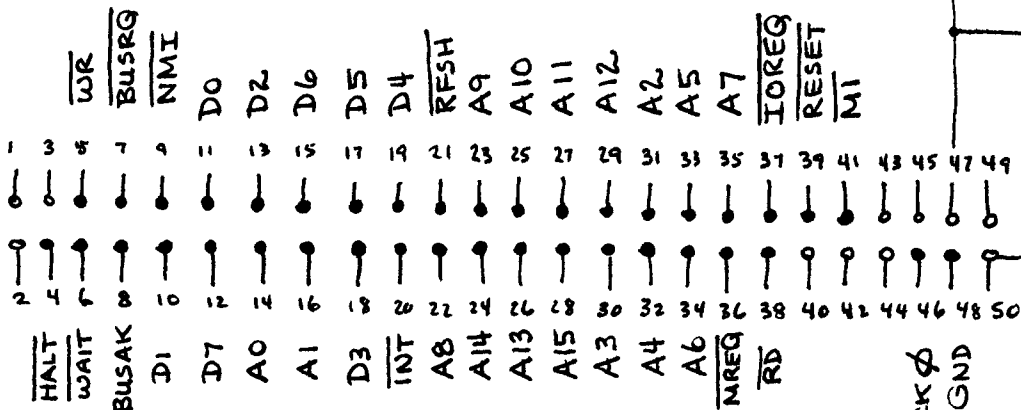
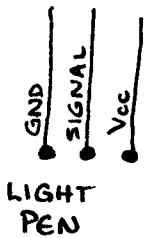


CASSETTE ROM TERMINAL

(NOTE: pins # 0, 12, 25 are connected inside the ROM cassette)



DON'T TAKE THESE SIGNALS AS GOSPEL TRUTH. THEY MIGHT BE CORRECT.



REAR OF BOARD

CPU CLOCK
GND

APPLICATIONS PROGRAMMING ENTERPRISE

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George M. Hale/Owner

February 16, 1979

Charles F. Vollmer
National Service Manager
Bally Manufacturing Corporation
Consumer Products Division
10750 West Grand Avenue
Franklin Park, Illinois 60131

Dear Sir:

By this time my letter of February 12 might have come to your attention. Today I received in my PO Box the PA-1 Service Manual mailed by your staff February 13. I believe that it contains most of the information I was seeking.

There has been some interesting crossing of the mails here. On February 14 I had mailed a letter to Robert Fabris, the man in San Jose, California, who heads the Bally user's publication Arcadian. In the letter I described the pin-out information that I had obtained by making a visual inspection of and electrical resistance checks on the circuit board of my "Home Library" computer. My pin-numbering convention on the 50-pin expansion connector was reversed from yours, but otherwise things look pretty good and your schematic will allow me to update my pin diagram. Apparently the 26-pin terminal and the 10-pin terminal are for service checks only? (I see them referenced in the schematic.) And the pin-numbering convention seems to be to number from right to left as one looks at the edge of the terminal, with odd numbers on the top side of the board and even numbers on the bottom side of the board? Correct that only if its wrong. Knowing that the cassette ROM was a 24-pin device and how the ground pins were connected, I numbered the 26-pin cassette ROM^{terminal} beginning with pin 0. Your schematic has it the same way! It's the logical thing to do, of course, but nobody will believe I arrived at that information on my own.

During the past week I have accepted a long-term position at a major production facility in the Kansas City area and my consultant work is going to revert to a part-time thing, with A.P.E. taking on the aspect of a software referral service. When you come out with the Add-On unit, if you want a good dealership outlet, I suggest that you contact Mr. F. L. Schmutz, the Computer Room, 816-531-1050.

Incidentally, I have had no problems with the North Bingo game since I disassembled and re-assembled my computer. Perhaps the problem was a fluke caused by dirt.

Dove

George M. Hale

SOFTWARE

ELECTRONICS

