Diagnostics & Configuration

To enter the Diagnostic & Configuration state of the controller, press the small button mounted on the PCB labeled "SWDIAG_1". **NOTE:** In software version 1.0, you can press an external push button label "DIAG". After pressing this button, the first configuration item is displayed. If configuration item #2 is set to "0"(Text), you will see "GAmE CounTEr". If Item #2 is set to "1"(Hex) you will see "-1".

Use the appropriate "SWDIAG_1/DIAG" button to advance through the item #'s. To change the value of an item, once the proper item has been selected, press the play button. Pressing the play button the first time displays the current value(Firmware version 1.0d or later). Pressing the play button increases the value of the current item #. If the value exceeds the range of the current item, it rolls over and starts with the minimum value of the range.

Hex Rep.	Alphanumeric Representation	Description	Selection / Range	Default
1-	"GAME COUNTER XXXXX"	A credit counter that increments by 1 for each quarter, and 4 for each dollar. (0 - 65535) NOTE: At 65535, the counter rolls over to 0.	Pushing the play button displays a relative Game Counter.	?
2-	"QUARTERS = XXXXX DOLLARS = XXXXX $XXXXX"	Show the number of quarters & dollars that should be in the machine. Then shows a dollar amount of the money in the machine. (25 represents $00.25, while 2500 represents $25.00)	Pushing the play button displays the Qty. & Dollar amount of money in the machine. NOTE: Cleared upon exiting Diagnostics & Configuration.	?
3-	"TEXT"	Determines how the Diagnostic & Configuration items are displayed.	RANGE (0 - 1) 0 = Text Representation 1 = Hex Representation	1 Hex
4-	"PRESS PLAY TO CLEAR ALL CREDITS"	Eliminates all credits on the credit display.	Pushing the play button removes all credits.	
5-	*"COINS PER PLAY"*	*Number of coins per credit* RANGE (0 - 7)		1
6-	"PLAYS PER DOLLAR X	Number of credits added per Dollar	RANGE (0 - 7)	4
7-	"PRIZE MOTOR INC XXX	Increments amount of time the Prize motor runs after each game.	RANGE (0 - 99(+125)) 100ths of a Second.	50(175) 4 s
8-	"PRIZE MOTOR DEC XXX	Decrements amount of time the Prize motor runs after each game.	RANGE (0 - 99(+125)) 100ths of a Second.	50(175) 4 s
9-	"GAME TIME X"	Maximum game time allowed before arm automatically moves across, and finishes the game.	RANGE (0 - 63) Seconds NOTE: Zero Disables	45
A-	"TILT TIME X"	Time in seconds that the game stays in tilt mode after tilt sensor is triggered.	RANGE (0 - 63) Seconds NOTE: Zero Causes Chirp Only.	2
b-	"DEMO INTERVAL XX"	Time in minutes before arm moves across mirror with gate closed for attention getting.	RANGE (0 - 63) Minutes. NOTE: Zero Disables.	1
C-	"PRIZE MOTOR TEST AMOUNT XX"	Number of times to turn the prize motor on / off during a test.	RANGE (0 - 63) Tests	60
d-	"PRESS PLAY TO TEST PRIZE MOTOR"	Turns the prize motor on / off the number of times programmed by prize motor test amount. Used for testing prize amount per quarter.	Pushing the play button causes the Prize motor to be run the number of times programmed by "PRIZE MOTOR TEST AMOUNT.	
E-	"DEFAULT ALL"	Sets all Diagnostic / Configuration items to there default values.	Pushing the play button will set all programmable options to there default values.	
F-	"PRESS PLAY TO EXIT"	Exits Diagnostic / Configuration	Pushing the play button will return the controller to game operation.	

NOTE: Insertion of a coin will return the controller to game operation! **X** - Represents a numeric amount.

****** *#5- Description: Number of coins per credit.*

Introduction

This manual attempts to provide the user/operator with details of the implementation of the LAX Jr. Controller PCB. A complete description of the microprocessor architecture and programming is beyond the scope of this document.

Features & Capabilities

MicroProcessor driven
- Solid State Output devices
- Optically isolated contact inputs

Battery backed settings
- 10 year storage
- Non-Resetable Game Counter
- Operation & Configuration
- Credits

Digital Audio
- Provides game audio sequences

High Current Outputs
- 6-Amp outputs for Gate & Motor

Ticket Dispenser Interface
- 4-pin Deltronics DL-1275 Connector

Power Supply
- Off card VCC(+5) VDC & VEE(+12VDC) required

Two Digit Credit Display
- 1.02" 7-Segment LED Displays
- Operate via VEE(+12VDC)
- Segment Addressable

Hardware

A.C. Inputs & Outputs

Connector & Pin Number	Description of Connection	Pin Location
	Incoming A.C. Power	
J1-1	A.C.- Line In (Hot)	Upper Left Corner
J1-2	A.C.- Line In (Neutral)	
	Turn Table Motor	
J1-3	A.C.- Turn Table motor (Hot)	
J1-4	A.C.- Turn Table motor (Neutral)	
	A.C. Lights or Accessories	
J1-5	A.C.- Lights (Hot)	
J1-6	A.C.- Lights (Neutral)	
	A.C. Bill Acceptor	
J1-7	A.C.- Bill Acceptor (Hot) NOTE: For use with 120VAC models only!	
J1-8	A.C.- Bill Acceptor (Neutral)	
	Spare Non-Switched A.C. Output	
J1-9	(Hot)	
J1-10	(Neutral)	
	Prize Motor	
J1-11	A.C. -Prize Motor (Hot)	
J1-12	A.C. -Prize Motor (Neutral)	

NOTE: All A.C. outputs are fused at 10 Amps Combined.

Inputs & Outputs

Connector & Pin Number	Description of Connection	Pin Location
	Coin Door	Lower Right Corner
J2-1	Coin Door Lamp "Power" (VEE) NOTE: If a double coin door is used, wire both lamps in parallel(120mA max.)!	
J2-2	Coin Door Lamp "Switched Ground" (GND)	
J2-3	Coin Door Switch "Input" (N.O.) NOTE: If a double coin door is used, wire both switches in parallel!	
J2-4	Coin Door Switch "Ground" (COM)	
	Bill Acceptor	
J2-5	N/C (No Connection) NOTE: Was going to be used for dollar inhibit	
J2-6	N/C (No Connection)	
J2-7	Output from Bill Acceptor NOTE: Bill Acceptor must be set to 1 pulse per dollar for proper operation.	
J2-8	Output from Bill Acceptor	
	Play Arm	
J2-9	12VDC Play motor "Switched Power" (VEE)	
J2-10	12VDC Play motor "Ground" (GND)	
J2-11	Play Arm CAM Switch "Input" (N.O.)	
J2-12	Play Arm CAM Switch "Ground" (COM)	
	Play Button	Upper Right Corner
J3-1	Play Button Lamp "Power" (VEE)	
J3-2	Play Button Lamp "Switched Ground" (GND) 120 mA max!	
J3-3	Play Button Switch "Input" (N.O.)	
J3-4	Play Button Switch "Ground" (COM)	
	Speaker	
J3-5	20 Watt Audio amplifier "Output" (Speaker +)	
J3-6	Audio "Ground" (Speaker -)	
	Prize Gate	
J3-7	12VDC Prize Gate "Switched Output" (VEE)	
J3-8	12VDC Prize Gate "Ground" (GND)	
	Tilt Switch	
J3-9	Tilt Switch "Input" (Pendulum)	
J3-10	Tilt Switch "Ground" (Ring)	
	Spare Input	
J3-11	"Input" (N.O.) NOTE: External Diag switch in Software Version 1.0	
J3-12	"Ground" (COM)	

Power Supply PWR Connector

Pin Number	Description of Connection	Pin Location
1	N/C (No Connection)	Left Hand Pin
2	VCC +5 VDC Regulated. 1 Amp max.	
3	VEE +12 VDC Unregulated. 5 Amp min.	
4	N/C (No Connection)	
5 & 6	GND Ground	

NOTE: The LED indicates the presence of VCC (+5)

DIAG/LOG Connector

Future feature connector for usage logging, remote system polling, and or requesting service/stock.

Software

Game Operation

The LAX Jr. controller operates in (4) different states.

1. **"RETURN ARM"** - This is the state the machine enters upon power up. It runs the motor until the arm switch opens. Once the arm switch opens, the arm motor is shut off, and control is transferred to "GAME WAIT". If the arm is being returned by the "GAME PLAY" state, a motor decel sound is played.

2. **"GAME WAIT"** - In this state, the machine waits for a credit(s). Upon receiving a credit, the controller enters the "GAME PLAY" state. If this is the first credit inserted, a horn sound is played followed by a car starting sound. **NOTE:** Credits can be received during all states!

3. **"GAME PLAY"** - The prize gate is opened, Play button lamp is turned on, and the player controls operation of the arm until the arm switch closes. During the player control portion of the game, appropriate motor sounds are played in conjunction with the play button being pressed. Once the arm switch closes, the prize motor runs the allotted time, and the controller enters the "RETURN ARM" state. When the arm is returned home, the prize gate is closed and the sound is shut off.

4. **"TILT"** - This state can only be entered by the closing of the tilt contacts, but can be entered at any time. During the duration of this state, the prize gate is closed, play lamp & coin door lamps are turned off, and a siren sound is played at an elevated level. The controller remains in this state for the programmed time, then returns at where it left off.

Layout
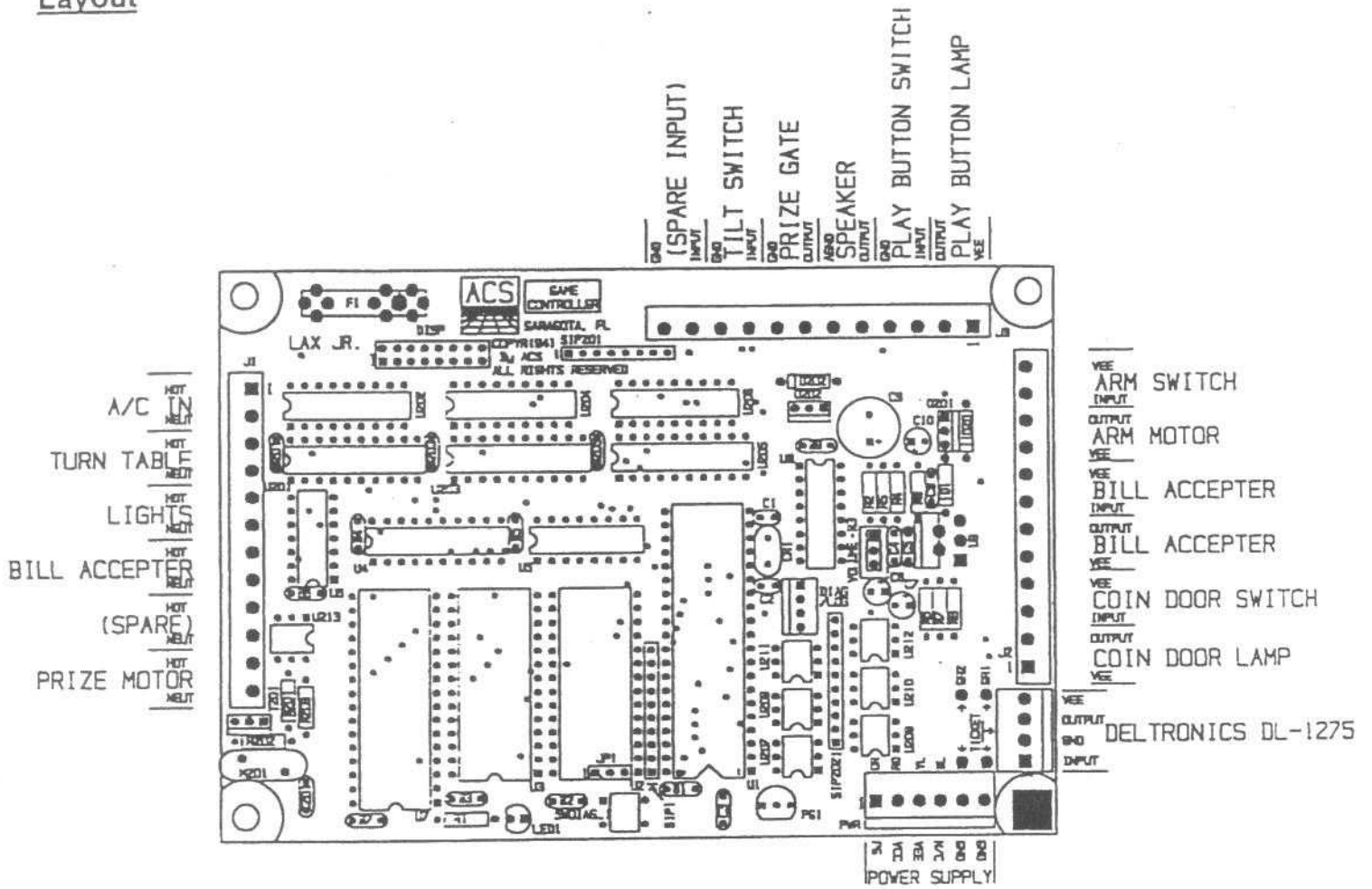
Component Placement & Connections

To:
Subject: Lax Jr

* First Release : 8/15/94 version 1.0
*
*   09/08/94   -   Version 1.0a
*   Fix DIAGS Clear Credit
*   Default Prize Motor Test Amount in NV_Init
*   Fix the word Prize in PRESS PLAY TO TEST PRIZE MOTOR
*
*   09/13/94   -   Version 1.0b
*   Swap diag options 2 & 3
*   Change Prize motor Timer to be 125 + (0 - 99)
*   Change Numeric Diags mode from -# to #-
*   Added Print2D command to print 2 characters at a time
*   Added Diag option to decrease Prize Motor Timer value
*   Slowed down LED Scroll rate
*   Credit counter is number of games played!
*   09/15/94   -   Version 1.0c
*   Changed Plays per Coin to Coins Per Play
*   Changed Credits per Dollar Default to 4 instead of 1
*   09/23/94   -   version 1.0d
*   Fixed Problem with Coin Counter on first power up
*   Default all now zeros CoinsInserted
*   Dollar bill closure now exits DIAGS like coin closure
*   Changed Default Plays per dollar to 4
*   Changed Default Game Time from 0 to 45 seconds
*   Changed Default Demo Time from 0 to 1 Minutes
*   Changed Default Prize Motor Test Amount from 20 to 60
*   Changed Default DIAG Mode to Hex #
*   First time Diag mode Play button is pressed, the current
*   value is displayed.
*   Added version # to Power On Message
*   Fixed Demo to only go when no credits are remaining
*   Demo was going between Multi-Credit Games
*   Added Initalizing RAM Message at power on if Non-Vol. RAM
*   Contents are incorrect.
*   11/26/94   -   Changed spare input to display credits
*   Changed credit counter to 4 credits per dollar not games
*   2/5/95   -   Version 1.0F
*   Fixed bug in tilt routine. Game stays tilted whenever tilt
*   sensor is active.
*   Play Arm doen't cycle if arm was at home position when power
*   was removed.
*   6/5/95   -   Version 1.0G
*   Changed GameCounter on coins to one for every coin
*   Changed Prize Motor Run Length from 0 to 99 to 0 to 499
*   1/18/97   -   Version 1.0H
*   Added seperate playout functions for tilt sound
*   Added output for coins inserted counter
*   2/25/97   -   Version 1.0I
*   Fixed problem with coin & dollar Switch closure not being
removed
*   4/29/97   -   Version 1.0J
*   Slowed down switch scanning in wait for sound completion
*   2/4/98   -   Version 1.0K
*   Added lamp flashing on Dollar bill acceptor output
*   Change Prize motor drop time adder from 125 to 50
*   3/5/98   -   Version 1.0L
*   Changed Prize motor drop time adder from 50 to 20 in
interrupt
*   3/3/04   -   Version 1.0M
*   Removed GameSeconds=0 from play switch release

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