

Mutha Goose & Gaggle

Instruction Sheet

Please Read ALL instructions before beginning an installation

Overview:

The "Mutha Goose & Gaggle" is a multidrop network system that allows up to 63 game machines to be connected to a single master print station. It also has many features built in that makes it ideal for use in the Coin-Op industry.

Features:

- Up to 63 machines can use a single master printer station.
- Sequential mode allows the automatic switching to a backup printer.
- Fully stored bookkeeping.
- Reprint of last 5 monetary transactions.
- Cabling is readily available "Category 5" network wiring.
- Custom location header.
- Single cable "Daisy Chain" to all machines.
- One machine down does NOT affect other games.
- Industry proven RS-485 protocol for maximum reliability.
- Brown Out and Watch Dog protection.
- Easy to bypass for normal "manual" collect.
- Tampering with wires can not produce illegitimate vouchers.

Connections:

Base / Master Unit :

All of the connections are on the back panel and are marked on the case for ease of use.

Power	:	+9VDC 1000mA wall transformer 2.1mm plus tip positive.
Network	:	RJ-45 plug that leads to the first game in the network.
Printer A	:	Primary printer RS-232 connection.
Printer B	:	Optional backup printer, and all of the programmable settings are set from here.

Base unit wiring & Operation :

The base unit is very straight forward. The wall transformer goes into the power jack. Connect the proper length Cat5 cable to the network connector, this goes from the base unit to the first game in the system. Printer A is where the primary printer is attached, and Printer B is where the backup printer goes if you are using the system in “SEQUENTIAL” mode. Printer B is also the port that is used to program the custom settings.

Base unit operation is also very simple, but there are a few things to keep in mind. All settings that are location specific are set inside the base unit. Such as the location header, the date/time, how many units are in the system, and other voucher settings that are consistent through out the location. Most settings are done through the three banks of DIP switches that are inside the unit. Refer to the DIP switch chart while reading the following settings.

Base Unit DIP switch setting explanation:

(See the DIP switch Chart)

<u>Description</u>	<u>Possible settings</u>	<u>Explanation</u>
Maximum number of machines in network	8 - 63	This setting is set to the lowest number that is equal or greater than the number of machines in the network.
Operation Mode	Single Printer	Printer Port A is the sole output
	Sequential	Port A and B are both used, if one printer goes down the other takes over.
	Diagnostics	Printer Port A is the sole output, and all network messages are printed out. Useful when first setting up a location.
Printer Type	Generic	Generic ASCII printer
	Citizen/Epson	Use the special features of these printers.
	Star Micronics Ithaca 70 series	Use Star control codes Use Ithaca control codes
Use Date & Time	Yes/No	Should the date and time be printed.
12 or 24 HR Clock	12/24	Time be in 12 or 24hr format
Auto Adjust for DLS	Yes/No	Should the unit auto adjust for U.S. Daylight Savings Time
Use Custom Header	Yes/No	If a location specific header has been programmed, should it be used.

Multi-voucher Mode

Yes/No

Also called the ticket mode, if set to yes the unit will print one voucher for every trip point reached. Not recommended for low value trip points.

What Should the Voucher be printed in.

Money
Points
Credits
Tickets

Print in dollars/cents.
Print the amount in points.
Print the amount in credits.
Print the amount as tickets.

If money dollars or cents

Dollars
Cents

The value is in whole dollars.
The value has fractional dollars.

Customer Signature area

Yes/No

Print an area for the customer to sign when redeeming the voucher.

Locality Specific Information

These settings are constantly in flux, but there will always be a NONE ,USER, and CUSTOM setting. NONE means just that, USER is to print information that is entered by the operator, and the CUSTOM setting is reserved by us. Any other settings on your paperwork are to print the data in such a manner to be more acceptable in that area.

Base Unit External and internal buttons :

The standard base unit comes with 2 external buttons, an LED, a key switch, and a buzzer. The key switch is to disable the book keeping button which also disables the clear book keeping function. This is to keep a curious location employee from checking to see how much money is in a particular machine, or clearing out the book keeping to cover missing money. The Reprint/Summary button causes the base unit to issue a reprint of the last 5 voucher events including the current date and time and the original vouchers' date and time if that feature is turned on. The book keeping button causes the base unit to print the total amount of vouchers printed and then polls every game to collect the individual numbers. After this is done pressing both buttons (reprint and books) will cause the base unit to reset its' books and instruct all active slave units to do the same. For normal operation the key switch should be in the off position. The LED will light and a buzzer will sound if the system suffers from a printer error that needs human intervention. When the base is in this state it will instruct all of the games on the network to go into standby mode, which can lockout any collects and/or disable the DBA, resolving the printer error (usually an out of paper condition) will cause all of games to come back online and any pending events will get handled. Inside the base unit there are 4 more push buttons located on the front edge of the PCB. These can be accessed by removing the 4 panel screws and lifting the top panel off. This is also how you access the DIP switch banks. These buttons have different functions depending on the mode of operation the base unit is in. When setting up a location the base unit should be placed in the DIAGNOSTIC mode until the system has been tested and verified. The internal buttons will help with this.

The following button functions are valid only when the unit is in DIAGNOSTIC mode.

- Button 1 : Base unit prints a summary of its' current settings.
- Button 2 : Poll all possible node / slave addresses (1 - 63) for current settings even if the base unit is set to poll less that 63. This is useful to check out how each unit is set and make sure there are no units set to the wrong node number.
- Button 3 : The base unit will send out the request for all units to coin up 100 credit units times the credit per dollar multiplier on the slave unit.
- Button 4 : Pulses the remote collect line.

The Following button functions are for all other modes :

- Button 1 : Base unit prints a summary of its' current settings.
 - Button 2 : Base unit prints entire location book keeping.
 - Button 3 : Base unit goes into setup mode for entering date/time/header information. See setup mode below.
 - Button 4 : Unused.
- Button Combinations
- Buttons 1 & 2 : Clears Base unit books.
 - Buttons 1 & 3 : Clears slave unit books.
 - Buttons 1 & 4 : Clears entire base unit memory. Use if RAM error occurs.

Setup Mode:

When the unit is in a normal operation mode (any mode but DIAGNOSTICS) pressing the internal button 3 will put the system in setup mode. You use setup mode to set the date and time, enter a custom header message, or add locality specific information to the voucher. You use a PC or laptop PC with a 9 pin female to 9 pin female straight through cable, and terminal software. "Windows" based PCs can use the HYPERTERM software that comes bundled with Windows. To make the connection, connect the cable between PORT B on the base unit and a serial port on the PC. Set your terminal software to 8 data bits, one stop bit, no parity, no flow control. Then press button 3. You will get a menu of choices and instructions from the base unit. If at any time you get lost, or things don't seem to be functioning press the reset button to allow the system to go back to normal operation. It is best that the network not be in use while making any changes. See the attached sheets for more detailed information on using your PC to setup your base unit. The unit must have either a printer or a printer bypass plug (available on request) connected to PORTA for the unit to go into setup mode from a power up state, or you can plug the PC into PORTA and then move it to PORTB after the power up message.

Misc. Base Unit Notes :

We recommend the Citizen IDP-3551 serial printer for its' reliability, ease of use, price, and the ability to print in two colors. When set to the CITIZEN setting the base unit takes full advantage of the Citizen printers' ability to print in both red and double sized characters to make all vouchers and reports as easy to read as possible, and as hard to falsely duplicate as possible. While all of the other manufacturers make a fine product, and we make use of any special features they have to offer, we have found the IDP-3551 to be the optimal choice. In any case, when choosing a printer it should offer the following communication protocol for proper operation : 9600baud, 8 data bits, one stop bit, and DTR/DSR flow control. Also, the printer should provide a battery backed buffer, so any unprinted characters are not lost during a power failure. Other settings will be based on how the unit is being operated. In the single printer mode, we do not recommend that the unit be fully unsupervised, and the printer should offer a buffer of at least 2000 characters. In the sequential mode we recommend that the buffer be set to 200 - 300 characters if possible. This allows the backup printer to take up where the other left off without having any vouchers caught in limbo. If the network has more than 20 machines the system should not be run as an unsupervised location, and the printers should be set to the highest buffer value, 2000 characters or above, to maximize system throughput. In this situation any vouchers stored in the printer buffer will be printed when the paper is reloaded. These settings should be followed even if the system is set up with a backup printer and the unit is being run in sequential mode. We have included sheets on the recommended DIP switch settings for the Citizen printer in the following DIP switch sheets.

Slave Unit Wiring and operation :

All connectors have a square solder pad denoting Pin 1 and the connector designator text (J1, J2, J3) is nearest pin 1.

<u>Connector</u>	<u>Pin</u>	<u>Description</u>	<u>Wire Color</u>
J1	1	Credit Pulse In	Orange
J1	2	Coin In for book keeping	Grey
J1	3	Bypass Switch +	Red
J1	4	Bypass Switch -	Black
J1	5	Tamper Switch +	White
J1	6	Tamper Switch -	Black
J2	1 & 2	Power GROUND	Black & Green
J2	3 & 4	Power +5VDC	Red & White
J3	1	Credit Return/Out	Blue
J3	2	+5VDC out (not used)	
J3	3	Remote Collect (not used)	Yellow
J3	4	+5VDC out (not used)	
J3	5	Error Lamp -	Violet
J3	6	Error Lamp + for 5v lamp	
J3	7	System Enable/ Switch GND	Green
J3	8	+5VDC out (not used)	

How to wire your cabinet to the slave unit :

J1

The ORANGE wire (Pin 1) should go to your source of pulses when the unit is collected. In a “Cherry Master” Style game this is Pin 28 parts side on the edge connector, or the signal that is commonly referred to as “KEY DOWN COUNTER”.

The GREY wire (Pin 2) is connected to the “In Meter” line and is used solely for book keeping and reporting. There is a setting to divide this count before reporting so you can keep all your meters equal even if the games are not. For example, if your games’ out meter is in nickels, but you want it to report in dollars set the coin in divisor to 20.

The RED wire (Pin 3) and its’ ground (Pin 4) are for a bypass switch. If for some reason the network were to go down the slave unit is normally wired to disable the collect button and the DBA, to manually re-enable these functions a switch (We recommend a key switch) can be connected here. A system of hand written vouchers can then be employed until the error is corrected.

The WHITE wire (Pin 5) and its’ GROUND (Pin 6) are to be used with an alarm style normally open (N/O) reed switch. If the game is opened the base unit will sound an alarm and print out a voucher showing which machine is the one being tampered with.

J2

The power cable should go directly to the power supply, do not use the PCB edge connector for a tie point. The BLACK and GREEN wires go to DC GROUND and the RED and WHITE wires go to +5VDC.

J3

The BLUE wire (Pin 1) is used when returning any unused credits back to the machine. To take advantage of this feature, the machine should have a credit or service input that can be set on a 1 to 1 ratio and the unused credit return option should be turned on.

The YELLOW wire (Pin 3) is currently unused.

The Violet wire (Pin 5) can be used to light an error lamp on a machine to let the location know the machine is not currently on the network, or is malfunctioning.

The GREEN wire (Pin 7) is the system enable line. For the utmost in security and reliability this wire should be properly used. The normal ground should be removed from the COLLECT switch and this line be put in its' place. This will keep a player from trying to collect a machine when the network is down for one reason or another.

It should also be connected to the ENABLE- pin on the DBA (see your DBA documentation for the specifics) so money can not be placed in a machine that is not currently online.

LAST NODE

The board also includes a pair of jumper pins labeled LAST NODE, this should be shorted if the machine is the last in the string. In other words the "NETWORK IN" plug is used but the "NETWORK OUT" plug is empty. The machine number itself is not important, just whether it is the last in the string or not.

Slave Unit DIP switch setting explanation:

(See the DIP switch Chart)

<u>Description</u>	<u>Possible settings</u>	<u>Explanation</u>
Pulses in to equal one internal point	1 through 5000 (Some may have custom settings)	This is the number of pulses the game has to put out to get something. For example 100 nickels to get an internal point.
Each point is worth	1 through 1000	What is the above point worth. In keeping with the above example, 100 nickels would be worth 5 items. The base unit will then use its' settings to determine if that should be dollars, points, tickets, or whatever.
Unused Credit Return	ON/OFF	Should any "odd" credits be returned To the game.
Credit Speed	FAST/SLOW	Some games require a slower coin Pulse than others.
Coin In Divisor	1 through 100	This setting allows you to use the system to keep track of all of your machines in the same denomination. That way If you have penny, nickel, and quarter games all in the same location, you can keep track of all of them in dollars. This is simply for book keeping simplicity.

Remote out
pulses/dollar

1 through 100

This setting is currently only used when sending out diagnostic credits from the base unit. The remote credits are multiplied By this to get a standard dollar out.

Node Number

1 through 63

Each slave has to have a unique number so the master can identify and communicate with it. When a voucher is printed the node or machine number is printed at the top. You add up the switch values to get the node setting.

Slave Unit Buttons :

The slave unit has two function buttons that can be used to print and/or clear the book keeping and the setup of the individual machine. The functions just duplicate what can be done globally from the master, but on a machine by machine basis.

BUTTON 1 : Print the Books for the specific machine.

BUTTON 2 : Print the status/setup of the specific machine

COMBO of 1 & 2 : Clears the memory of the specific slave unit.

Misc. slave notes :

The node number is also the "Machine Number" on the printed voucher. All of the slave unit inputs are diode blocked and optically isolated, so the inputs are protected from a continuous 75V source, and a 2500V spike. This means the inputs can coexist with PROPERLY wired hard meters if you need to double check the validity of any book keeping numbers. The status LEDs on the unit should give you a basic idea if anything is going awry. The red LED is on when the unit is on and executing instructions. The yellow LED is on when the unit is sending data out onto the network. The green LED is on when there is incoming network traffic. In a normal situation the red LED should be on, the yellow should flash about once a second, and the green should flicker all the time. Also, the in and out cables should have some type of strain relief attached to them where they enter and exit the cabinet. A cable tie with an integral screw hole is perfect. That way a player or route person pulling on the cabinet does not break the network connector on the slave board.

See the attached sheets on safety an reliability for additional information.

Mutha Goose V1.40NDL									
Description	Value	DIP Switch Bank 1							
		1	2	3	4	5	6	7	8
Maximum Number of Machines in Network	8	0	0						
	16	1	0						
	32	0	1						
	63	1	1						
Operation Mode	Single Printer			0	0				
	Sequential			1	0				
	NOT USED			0	1				
	Diagnostics			1	1				
Printer Type	Generic					0	0		
	Citizen/Epson					1	0		
	Star Micronics					0	1		
	Ithaca 70					1	1		
NOT USED	N/U							0	
Use CIAO Baby Credit Unit	No								0
	Yes								1

Mutha Goose V1.40NDL									
Description	Value	DIP Switch Bank 2							
		1	2	3	4	5	6	7	8
Use Date and Time	NO	0							
	YES	1							
12 or 24 Hour clock	12		0						
	24		1						
Automatically Adjust for Daylight Savings	NO			0					
	YES			1					
Use Custom Header Message	NO				0				
	YES				1				
Multi-Voucher Mode (Ticket Mode)	NO					0			
	YES					1			
NOT USED							0	0	0

Fledgling

Replacement for the Gaggle

Overview :

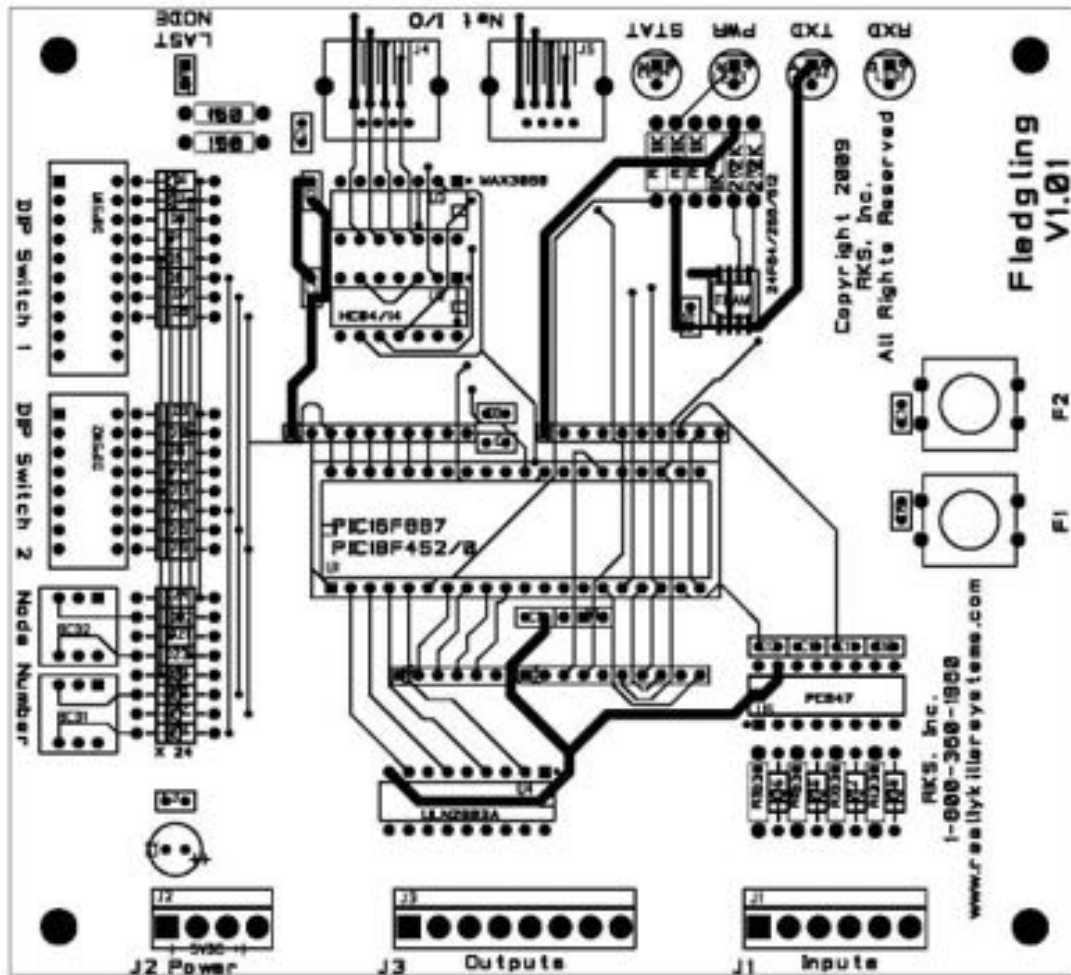
The Fledgling PCB is a direct, pin for pin compatible, replacement for the Gaggle PCB. It incorporates some technology improvements along with some enhancements to ease installation and operation.

Enhancements and changes :

The Fledgling can operate from 4.5 to over 5.25VDC with no compromise in reliability. It now uses direct setting rotary switches to set the machine number, so no more adding up the values on DIPSW3, just set 01 to 63 on the dials and off you go. All of the printout value options are now on DIPSW1 which is a 10 position unit, no more spill over onto DIPSW2. The battery backed RAM has been replaced with a nonvolatile FRAM, so there is no battery to go dead down the road. The firmware supports the latest Mutha operating modes, such as daily books along with the standard book keeping data, and all the stored data is stored redundantly, so if one copy gets corrupted the back up copy is used to restore from.

What this all means is a better product to you at the same price point.

PCB Layout :



Flodeline V1.00

Description	Value	DIP Switch 1									
		1	2	3	4	5	6	7	8	9	10
Pulses in to equal one internal point (Pulses in to get a voucher)	1	0	0	0	0	0					
	2	1	0	0	0	0					
	4	0	1	0	0	0					
	5	1	1	0	0	0					
	8	0	0	1	0	0					
	10	1	0	1	0	0					
	15	0	1	1	0	0					
	20	1	1	1	0	0					
	25	0	0	0	1	0					
	40	1	0	0	1	0					
	50	0	1	0	1	0					
	75	1	1	0	1	0					
	100	0	0	1	1	0					
	150	1	0	1	1	0					
	200	0	1	1	1	0					
	250	1	1	1	1	0					
	400	0	0	0	0	1					
	500	1	0	0	0	1					
	1000	0	1	0	0	1					
	2000	1	1	0	0	1					
2500	0	0	1	0	1						
5000	1	0	1	0	1						
	0	1	1	0	1						
	1	1	1	0	1						
Internal point is multiplied by : (What the above number is worth) For example, If the machine is a nickel out and you want to collect in \$5.00 increments, you would set the internal point value to 100 and the multiplier to 5. 100 nickels = \$5.00	1						0	0	0	0	
	2						1	0	0	0	
	5						0	1	0	0	
	10						1	1	0	0	
	15						0	0	1	0	
	20						1	0	1	0	
	25						0	1	1	0	
	50						1	1	1	0	
	75						0	0	0	1	
	100						1	0	0	1	
	150						0	1	0	1	
	200						1	1	0	1	
	250						0	0	1	1	
	400						1	0	1	1	
500						0	1	1	1		
1000						1	1	1	1		

Fledgling V1.XX									
Description	Value	DIP Switch 2							
		1	2	3	4	5	6	7	8
Unused Credit Return	OFF		0						
	ON		1						
Credit Speed (unused/remote)	FAST			0					
	SLOW			1					
Coin In Divisor For Bookkeeping	1				0	0	0		
	4				1	0	0		
	10				0	1	0		
	20				1	1	0		
	100				0	0	1		
						1	0	1	
Remote Out Pulses per Dollar	1							0	0
	4							1	0
	20							0	1
	100							1	1
DIP Switch 3 has been replaced with direct reading rotary switches									
Node Number	Set by BCD/Numerical Switch 01 - 63 valid range								

Gosling V1.00

Description	Value	DIP Switch 1								DIP Switch 2									
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
Pulses In to Equal one internal Point	1	0	0	0	0	0													
	2	1	0	0	0	0													
	4	0	1	0	0	0													
	5	1	1	0	0	0													
	8	0	0	1	0	0													
	10	1	0	1	0	0													
	15	0	1	1	0	0													
	20	1	1	1	0	0													
	25	0	0	0	1	0													
	40	1	0	0	1	0													
	50	0	1	0	1	0													
	75	1	1	0	1	0													
	100	0	0	1	1	0													
	150	1	0	1	1	0													
	200	0	1	1	1	0													
	250	1	1	1	1	0													
	400	0	0	0	0	1													
	500	1	0	0	0	1													
	1000	0	1	0	0	1													
	2000	1	1	0	0	1													
2500	0	0	1	0	1														
5000	1	0	1	0	1														
	0	1	1	0	1														
	1	1	1	0	1														
Each Internal Point is worth (Multiplied by)	1						0	0	0	0									
	2						1	0	0	0									
	5						0	1	0	0									
	10						1	1	0	0									
	15						0	0	1	0									
	20						1	0	1	0									
	25						0	1	1	0									
	50						1	1	1	0									
	75						0	0	0	1									
	100						1	0	0	1									
	150						0	1	0	1									
	200						1	1	0	1									
	250						0	0	1	1									
	400						1	0	1	1									
500						0	1	1	1										
1000						1	1	1	1										

See
Next
Sheet

Gosling V1.00																	
Description	Value	DIP Switch 2								DIP Switch 3							
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Unused Credit Return	OFF		0														
	ON		1														
Credit Speed (unused/remote)	FAST			0													
	SLOW			1													
Coin In Divisor For Bookkeeping	1				0	0	0										
	4				1	0	0										
	10				0	1	0										
	20				1	1	0										
	100				0	0	1										
					1	0	1										
Remote Out Pulses per Dollar	1							0	0								
	4							1	0								
	20							0	1								
	100							1	1								
Node Number Add Values for 1 - 63	1									1							
	2										1						
	4											1					
	8												1				
	16													1			
	32														1		
<p>For example Node 11 would be switches 1,2,4 on the rest off. $(1 + 2 + 8 == 11)$</p>																	

Not Used

5.2 DIP Switches Setting

1) DIP Switch 1

No.	Function	ON	OFF	
DSW1-1	Auto cutter	Yes	No	ON
DSW1-2	International characters	See the Table below		ON
DSW1-3	*			ON
DSW1-4	*			ON
DSW1-5	CBM command			CBM2 mode (IDP-3530 system)
DSW1-6	CR mode	See the Table below		ON
DSW1-7	Mechanism type	Graphic	Character	OFF
DSW1-8	Buffer size	6K bytes	256 bytes	ON
DSW1-9	Operation mode	See the table below		OFF
DSW1-10	*			OFF

*1, *3 : Depends on the type.

*2 : Depends on the destination.

*4 : Effective only when CBM mode is selected with DSW1-9 and -10. For details see "CBM Mode" in "PRINT CONTROL FUNCTIONS".

2) DIP Switch 2

No.	Function	ON	OFF	
DSW2-1	Bit length	8 bits	7 bits	ON
DSW2-2	Parity	No	Yes	ON
DSW2-3	Odd/Even	Odd	Even	ON
DSW2-4	Communication mode	DTR/DSE	NON/OFF	ON
DSW2-5	Baud rate	See the table below		ON
DSW2-6	*			ON
DSW2-7	*			OFF
DSW2-8	Unused	-	-	OFF

Baud rate

Baud rate	DSW2-5	DSW2-6	DSW2-7
150	OFF	OFF	OFF
300	OFF	OFF	ON
600	OFF	ON	OFF
1200	OFF	ON	ON
2400	ON	OFF	OFF
4800	ON	OFF	ON
9600	ON	ON	OFF
19200	ON	ON	ON

International Character Selection

Country	No.	DSW1-2	DSW1-3	DSW1-4
U.S.A.		ON	ON	ON
France		OFF	ON	ON
Germany		ON	OFF	ON
U.K.		OFF	OFF	ON
Denmark		ON	ON	OFF
Sweden		OFF	ON	OFF
Italy		ON	OFF	OFF
Japan		OFF	OFF	OFF

Character Code Selection

ESC/POS mode	CBM mode	Star mode
Code 437	CBM (International)	Star (International)
Code 850	Code 850	Code 850
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*
Katakana	CBM (Japanese)	Star (Japanese)

See the "International Character Codes Table and Character Codes Table."

CR mode (DSW1-6)

Mode	OFF	ON
CBM	CR+LF	CR
STAR	CR+LF	Ignored
ESC/POS	CR+LF	CR

Operation Mode DSW1-9 DSW1-10

Operation Mode	DSW1-9	DSW1-10
CBM	OFF	OFF
ESC/POS	ON	OFF
STAR	OFF	ON
STAR Auto cut	ON	ON

Citizen iDP-3551 Settings

Woosim Printer Settings



Denotes
Required Setting

ADP-300 MANUAL

Dip Switch Settings

This table gives the definition for the DIP switch settings.

Function	Setting	SW3										SW4			
		1	2	3	4	5	6	7	8	9	10	1	2		
S E R I A L	Emulation	Epson TM-U200	OFF	OFF											
		Citizen iDP3540	ON	OFF											
		Verifone P900	OFF	ON											
		Star SP200	ON	ON											
	CR Character	CR=CR Only			OFF										
		CR=CR + LF			ON										
	CPL	40/33 Char/Line				OFF									
		42/35 Char/Line				ON									
	Flow Control	Xon/Xoff					ON								
		DTR/DSR					OFF								
Baud Rate	38400						OFF	OFF	OFF						
	19200						ON	OFF	OFF						
	9600						OFF	ON	OFF						
	4800						ON	ON	OFF						
	2400						OFF	OFF	ON						
	1200						ON	OFF	ON						
	600						OFF	ON	ON						
	300						ON	ON	ON						
Data Bits/Parity	8 Bits None										-	OFF			
	7 Bits Odd										OFF	ON			
	7 Bits Even										ON	ON			
Cutter	Not Install												OFF		
	Install												ON		
2Color	Not Install													OFF	
	Install													ON	
P A R A L L E L	Emulation	Epson TM-U200	OFF	OFF											
		Citizen iDP3540	ON	OFF											
	CR Character	CR=CR Only			OFF										
		CR=CR + LF			ON										
	CPL	40/33 Char/Line				OFF									
	42/35 Char/Line				ON										
Cutter	Not Install								OFF						
	Install								ON						
2 Color	Not Install									OFF					
	Install									ON					

Installation Safety and Reliability

When a game stands alone it can operate with a myriad of problems that may have little or no effect on its performance that when they are networked together may cause anything from data errors, component damage, or even pose an electrocution hazard. This is a quick checklist of items that should be considered before and during the installation of any system that will tie multiple games together.

For safety purposes we highly recommend that this, or any other network system, be installed by a qualified service technician that can detect and correct any problems including, but not limited to, those listed below.

Location wiring :

The outlets should be checked for a valid earth ground and that hot and neutral are correct. A simple outlet checker, like those obtainable at Radio Shack, will alert you to any problems, or a knowledgeable person with a multimeter can also check the outlets. Just because there is a three prong outlet doesn't mean it's wired right!

Game Wiring:

The game should be properly wired with a grounded line cord and all subassemblies in the game should have a common earth ground going back to the incoming earth ground. Above all the power supply and the monitor have to provide isolation from the mains power. It is very common for the logic power supply to be isolated, but the monitor usually has to have an isolation transformer in line with the mains power. A few monitors have on board isolation, but if you are not absolutely sure have one installed. We have seen games that don't have isolation. The "manufacturer" got around it by not having the earth ground going to anything inside the cabinet. That allows the internal electronics to float at 60VAC without blowing any fuses. ***This is a VERY dangerous condition***, that should be corrected immediately. If you attempt to network a game in this condition you will damage the network board, and may even cause damage to other games that are connected to the network. An isolation transformer should be installed and the earth ground

should be properly routed before the game is connected to the network.

Network Wiring:

Use only the recommended network wire. We recommend the use of **Category 5** network cable with gold plated connections. The use of phone cable or a lesser “category” will either not work, or cause data errors. **DO NOT SPLICE WIRES**. The use of properly rated in line couplers is acceptable as long as the number is kept below 2 or 3. In other words, don’t use couplers to get around buying the proper length cables. Do not exceed the maximum length for any cable run. We allow 15,000 feet per run (if you exceed that...WOW), but always refer to the particular paperwork for the network you are using.

Network Topology:

Our network is designed on a “Daisy Chain” system. The output of one board feeds the input of the next until you get to the last unit. With an allowable cable run of 15,000 feet doing loop backs or runs off to other areas is not a problem. Our driver system is such that a dead machine will not bring the rest of the network down, but other systems might not be as lenient. The last node in the network should have the “LAST NODE” jumper installed. No other node should have it on. If you pull the last machine make sure you install the jumper on the new last node. The other common topology is a “Star” where a single master node has a separate connection to each and every machine. This topology usually does not require any special termination, but there is quite a bundle of wires to deal with, and there is usually a limitation on how far a cable run can go. As usual, if you are installing a system other than ours, refer to that documentation for any special requirements. Some “networks” that are being sold are not even networks at all. What you are buying is a big switch box that routes the actual game signals around. These systems usually have a severe limit on the number of games, and how far away they can be. Not only that, on some systems it is possible to tamper with the wires in such a way to give false credits. Watch what you are getting.

Reliability Issues :

Let’s face it these systems are designed to handle the money end of a multi-game installation, and to ignore things that may degrade or even

enhance system reliability would be a mistake. Make sure cables are not routed where a malicious person might easily tamper with them. Also, do not run cables where electrical interference would be an obvious problem, like over light fixtures, or around heavy electrical equipment. If a slave goes down it might not be the end of the world, but without the master the whole network is dead. Protect it with at least a spike protector, and for the utmost in safety and reliability have the master/base unit plugged into a UPS (a battery backed power supply). Also, make sure any printers or other peripherals are also protected. It might even make sense in a high volume or trouble location to have a UPS on every game. It may seem like a big initial expense, but in the long run it is cheap insurance. A 400VA unit per machine will allow any players to collect or play any remaining points and allow an orderly shut down. Have enough slack in the cabling behind a machine to allow route personnel to work without yanking on the wires. If the system has a diagnostic mode (ours does), run the system for a few hours with it turned on and see if any error codes or messages get kicked out. If anything, and I mean ANYTHING, isn't working right from the start you are just going to have trouble down the road.

I hope this has been helpful.