ARCADE GAME

WHAC A MOLE®

OWNER'S MANUAL

Bob's Space Racers Incorporated

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BOBSSPACERACERS.COM

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate frequency energy, and, if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

* * *

W A R N I N G :

ALL OF BOB'S SPACE RACERS® GAMES ARE SHIPPED WITH THE SAME KEY AND LOCK SETS.

IT IS IN YOUR BEST INTEREST TO CHANGE THE KEYS AND LOCKS ON YOUR GAMES WHEN YOU RECEIVE THEM.

SERVICE POLICY

At BOB'S SPACE RACERS®, INC., our strength lies in the high quality, long lasting equipment we manufacture.

Should the need arise, we maintain both Technical Support and Customer Service staff.

Technical Support is available whenever you should need it. The direct technical 'hot line' is (386) 677-0761. This line is manned 8:30am - 5:00pm, EST, Monday through Friday, excluding holidays. During all other times an operator will be available to relay your problem to the technician on call. Technical Support will assist you in troubleshooting a service problem or setting equipment options.

Customer Service telephone lines are manned 8:30am - 5:00pm, EST, Monday through Friday, excluding holidays. Customer Service staff can be reached at (386) 677-0761 they will also take parts orders and research the status of previous orders.

As always, you can call (386) 677-0761 to reach all other departments, or you can FAX anyone at BOB'S SPACE RACERS® by calling (386) 677-0794, 24 hours a day. You can, also, e-mail us at tech@bobsspaceracers.com, 24 hours a day.

BOB'S SPACE RACERS®, INC.'S
ONE-YEAR NEW EQUIPMENT WARRANTY

1. INCLUDED IN THIS WARRANTY Bob's Space Racers®, Inc. warrants to the original purchaser only that the equipment that is the subject of this sale conforms to its specifications, and is free from defects under normal service for a one-year period from the original date of delivery. This warranty does not include any damages resulting from occurrences listed in Paragraph 2 below. This Warranty is not transferable under any circumstance. Any claims under this warranty must be received in writing by Bob's Space Racers®, Inc. within 13 months from the date of delivery. Within a reasonable time of such written notification Bob's Space Racers®, Inc. will replace or repair any defective component of the equipment or part thereof which fails for reasons other than normal services, use, or wear. Light bulbs are specifically excluded from this warranty and shall be the sole responsibility of the purchaser. Bob's Space Racers®, Inc., within its sole discretion, makes the final determination as to whether to repair or replace any component and whether any such repair or replacement shall be performed where the equipment is located or at its home facility in Volusia County, Florida, or another facility of its sole choice. Any and all freight charges for the purposes of repair or replacement shall be paid by the original purchaser. All defective parts shall be returned to Bob's Space Racers®, Inc. if requested. Bob's Space Racers®, Inc. does not warrant that the equipment will meet any original purchaser's specific requirements or that the operation of the equipment will be uninterrupted. These remedies are the original purchaser's exclusive remedies for breach of warranty.

2. EXCLUDED BY THIS WARRANTY. Bob's Space Racers®, Inc. does not warrant (a) any product, components or parts not manufactured by Bob's Space Racers®, Inc.; (b) damage caused by use of the equipment for purposes other than those for which it was designed; (c) defects caused by failure to provide a suitable installation environment for the equipment; (d) damage caused by unauthorized attachments, modification, or service; (e) damage caused by normal wear and tear or improper power supply; (f) damage caused by accident or disaster such as fire, flood, lighting and wind; (g) any other abuse or misuse of the equipment.

3. EXCLUSIVE WARRANTY. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OR REMEDIES, WHETHER WRITTEN, ORAL OR IMPLIED. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, COURSE OF DEALING OR USAGE OF TRADE ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED.

BOB'S SPACE RACERS®, INC.'S
ONE-YEAR NEW EQUIPMENT WARRANTY (CONTINUED)

4. REMEDIES LIMITED. UNDER NO CIRCUMSTANCES, EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, SHALL BOB'S SPACE RACERS®, INC. BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECT OR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT INCLUDING BUT NOT LIMITED TO ANY CLAIM FOR LOSS OR PROFITS, LOSS OF SAVINGS OR REVENUE, LOSS OF USE OF THE EQUIPMENT, OR ANY ASSOCIATED EQUIPMENT, FACILITIES OR SERVICE, DOWNTIME, THE CLAIMS OR COST(S) OF THIRD PARTIES INCLUDING CUSTOMERS, AND INJURY TO PROPERTY. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

5. NO OTHER WARRANTIES. Unless modified in writing and signed by both parties, this agreement is understood to be the complete and exclusive agreement between the parties, superseding all prior agreements, oral or written, and all other communications between the parties relating to the subject matter of this agreement. No employee or representative of Bob's Space Racers®, Inc. or any other party is authorized to make any other warranty or to assume any other liability in connection with the sale of its equipment.

6. TIME LIMIT FOR CLAIMS. Any claim for breach of warranty or claims under this warranty must be received in writing by Bob's Space Racers®, Inc. within 13 months following delivery of the equipment.

7. FUTURE CHANGES. Bob's Space Racers®, Inc. reserves the right to reserve, change or modify the construction and design of its equipment or any component part or parts thereof without incurring the obligations to make such changes or modifications in present equipment.

8. ALLOCATION OF RISKS. This agreement allocates the risks of equipment failure between Bob's Space Racers®, Inc. and the original purchaser. This allocation is recognized by both parties and is reflected in the price of the goods. THE PURCHASER ACKNOWLEDGES THAT IT HAS READ THIS AGREEMENT, UNDERSTANDS IT, AND IS BOUND BY ITS TERMS.

9. TO OBTAIN WARRANTY SERVICE. The original purchaser must, at his own expense, bring or ship the equipment to an authorized location for service. Additionally, the original purchaser must pay all freight, shipping or transportation charges for the return of the equipment from Bob's Space Racers®, Inc. to the original purchaser. Telephone or write:

Bob's Space Racers®, Inc.
427 15th Street
Daytona Beach, Florida 32117
Telephone number 386-677-0761
FAX 386-677-0794

ADVANCED REPLACEMENT POLICY

After speaking with our Technical Department it may be necessary for Bob's Space Racers®, Inc. to ship an assembly item or part to repair your game. We will ship the item(s) according to your preference via United Parcel Service, Federal Express, US Postal Service, etceteras. Note: we will not ship anything to P.O. Boxes via the US Postal Service. You will be billed, per your account status, for the total cost of the shipment (which includes shipping charges).

Upon shipment of the new item(s) a Return Merchandise Authorization Number (RMA #) will be issued for you to use when returning the defective item(s) to Bob's Space Racers®, Inc., or you may use the order number. After the defective item(s) is received by Bob's Space Racers®, Inc. your account will be issued either a:

1. Warranty credit: if your game is under warranty. (See the Warranty Policy page.) Note: this credit does not include return shipping charges.

OR

2. Credit for the item(s). Note: this credit does not include return shipping charges, nor does it include the repair charges for the item(s).

If the item(s) cannot be repaired to the point where it could be shipped to another customer as an Advanced Replacement item (i.e. cosmetic damage), we will ship your original item(s) back to you. You will be required to return the Advanced Replacement item(s) or pay for it. You will be responsible for all shipping charges, should you decide to not keep, and pay for, the Advanced Replacement item(s).

ADVANCED REPLACEMENT ITEM(S) SHIPPING RULES

When you request an Advanced Replacement item from us, we have a few rules for you to follow:

1. **DO NOT** try to repair the defective item(s) on your own; **DO NOT** disassemble the defective item(s) prior to returning it to Bob's Space Racers®, Inc. – this could cause further damage and the possibility of you not receiving any credit at all on the item(s). There are not any user serviceable parts inside, and our vendors may void their warranty on disassembled parts. (Please review the last paragraph of the Advanced Replacement Policy.)
2. Wait for the Advanced Replacement item(s) to arrive prior to returning the defective item(s).
3. When the new item(s) arrive, verify that it is the correct part. If it is not, please note what the differences are and contact Bob's Space Racers®, Inc.
4. Return the defective item(s) in the exact same packaging the Advanced Replacement item(s) came in. This insures no more damage will be done to the item(s) during the return shipping.

Thank you for your cooperation.

OWNER'S MANUAL

CONGRATULATIONS!

Congratulations on your purchase of a Bob's Space Racers® Game! Bob's Space Racers® continues to lead the amusement industry in the manufacturing and the operation of amusement games and has operated these games at several of North America's largest expositions for the last 30 plus years. Some of these expositions include: The Canadian National Exhibition, Toronto, Ontario, Canada; The Calgary Stampede, Calgary, Alberta, Canada; The Minnesota State Fair, St. Paul, Minnesota, USA; The Ohio State Fair, Columbus, Ohio, USA; The Big E, Springfield, Massachusetts, USA; The South Carolina State Fair, Columbia, South Carolina, USA; and, The Dade County Youth Fair, Miami, Florida, USA. This experience has allowed us the opportunity to field test each piece of equipment that we manufacture, and helps us to stay in tune with the amusement industry with its ever-changing trends.

What you are about to read may appear a little overwhelming at first, but it will help you reach the high profits you seek. Keep in mind we are offering this only as a guide for you to get started. These tips have proved time and again to work successfully in our own operations over the last thirty years.

MANUAL INTRODUCTION

This owner's manual is divided into several sections beginning with Operator's Guide, Introduction and Set-up, and so on. We have provided direction on every aspect of the game from running and maintaining it to pertinent technical information and troubleshooting problems. We, also, cover coin mechanisms, ticket dispension, and prize redemption in the appendix section.

Each section has troubleshooting guides that contain enough information so that the game can be repaired with little difficulty. If this information is not sufficient, a call to Bob's Space Racers will provide additional assistance. Between the manual and the personal assistance, downtime of your game will be minimal. (When you call, we assume that you have read this manual and have tried the suggested repairs.)

This manual will be used for the following games: Whac-A-Mole®, Whac-A-Munch®, Kiddie Whac-A-Mole®, and Pattie Cakes®. These games operate basically the same way and have the same electronics.

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INSTALLATION AND SET-UP

INSTALLATION

1. Choose a suitable indoor location for the game and set in place.
2. Make certain there is adequate power for the game according to the Power Requirements Label(s) on the back of the game.
3. Remove all of the spare parts that were shipped with the game from inside the upper back door before plugging the game in. After those items have been removed, no one other than a equalified service technician should have access to the game inside the back door.
4. Plug the Air Compressor and the Game into a power outlet. When the compressor shuts off, open the back door and switch the game on. It is now ready for play.

SEQUENCE OF PLAY

1. Insert coin(s).
2. Pick up mallet
3. When moles start popping up, hit each mole with the mallet.
4. Tickets dispensed at end of game.

The object of the game is for the player to hit the moles (on their head as they pop up (or the lights as they light up). The pace of the game will increase as each mole (light) is hit. At game end the bell and beacon will go off. If enough points are scored, tickets will be dispensed (if applicable).

ELECTRICAL REQUIREMENTS

SINGLE-UNIT AND TWO-UNIT WHAC-A-MOLE, AND SINGLE-UNIT KIDDIE WHAC-A-MOLE

Voltage (v)	Hz	Amps (max operating)
100-125	60	1.6

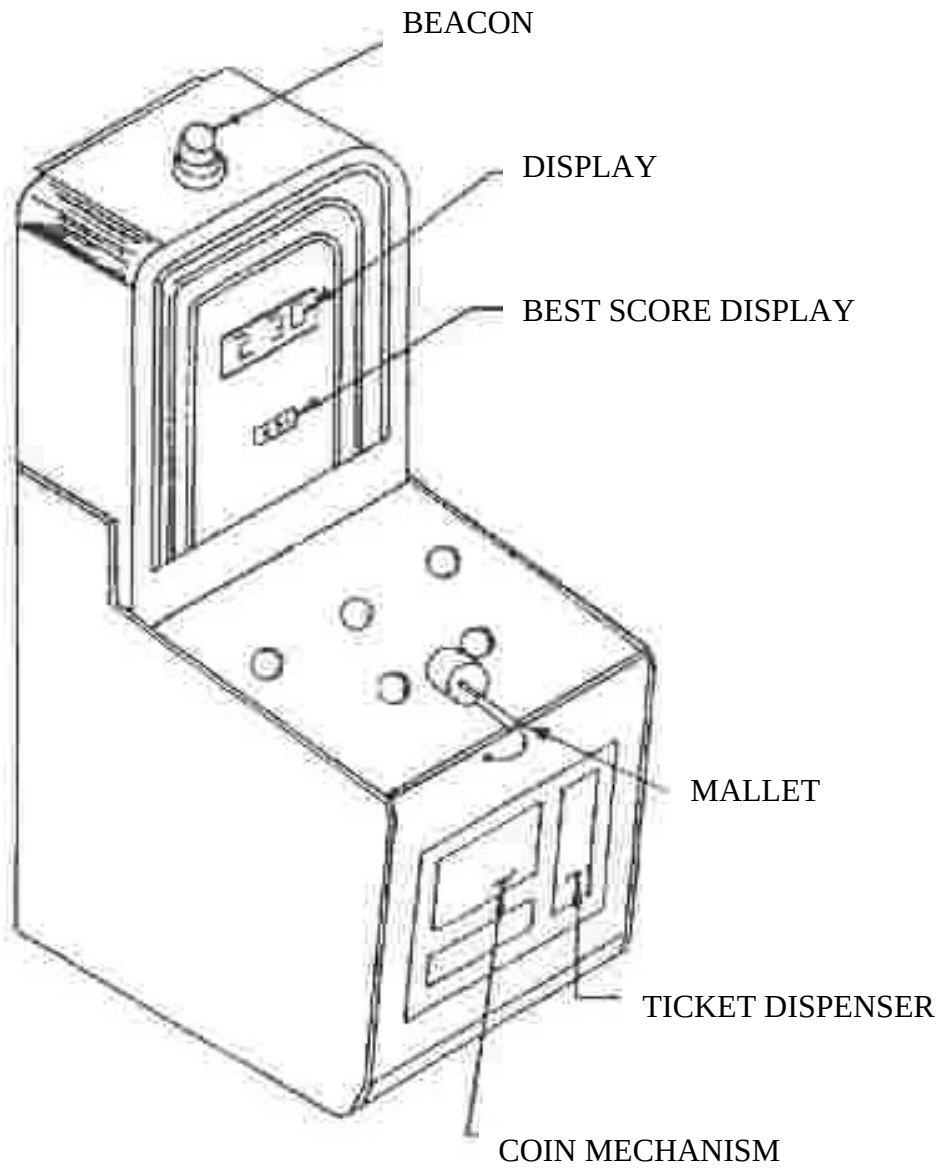
1/2HP GAST COMPRESSOSR

Voltage (v)	Hz	Amps
100-125	60	6.8

3/4HP BSR COMPRESSOR

Voltage (v)	Hz	Amps
100-125	60	11.8

SINGLE-UNIT WHAC-A-MOLE COMPLETE GRAPHIC



OPERATION

HOT SPOT/PATTIE CAKES
2400 BOARDS
VERSION WAM 24XX
* 3-HEAD *

Reg#	Reg Name	BSR	Actual	Description
00	GAME TYPE		_____	0=Whac-A-Mole; 1=Hot Spot/Pattie Cake; 2=Kiddie Whac-A-Mole (3 head)
01	COIN/GAME	1	_____	Number of Coins Required per Game
02	PLAYS/GAME	1	_____	Number of Plays per Game
03	POINTS/TICKET	10	_____	Number of Points per Ticket
04	FREE TICKETS	0	_____	Number of Free Tickets
05	MIN TICK/GAME	1	_____	Minimum Number of Tickets per Game
06	MAX TICK/GAME	8	_____	Maximum Number of Tickets per Game
07	BELL TIME	20	_____	Bell Time in 0.1 Seconds
08	BEACON TIME	50	_____	Beacon Time on 0.1 Seconds
09	GAME TIME	20	_____	Game Time in Seconds
10	MOLE SPEED	70	_____	Starting Mole Speed
11	MOLE DOWN	25	_____	Mole Down Time
12	COIN/BONUS	4	_____	Number of Coins per Bonus 1
13	BONUS VALUE	0	_____	Value of Bonus 1 in Extra Coins
14	BALLY TIME	60	_____	Bally Time Register (in Seconds)
15	MIN BEACON	10	_____	Minimum Win Score for Beacon to Run
16	MIN BELL	25	_____	Minimum Win Score for Bell to Sound
17	LIGHT CHASE	0	_____	Light Chase Type; 0 = Single; 1 = 3 light
18	DISPLAY TYPE	0	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit

Game Sound: ABC (File Name: ABC.vox)
Other Settings: _____

_____

_____

Program Approved For: BSR **Release Date: 3/3/2006**

KIDDIE WHAC-A-MOLE
2400 G BOARD; WAM 2401 V-0.5
* 1-PLAYER *

Reg#	Reg Name	BSR	Actual	Description
00	GAME TYPE	2	_____	Kiddie Whac-A-Mole (3 head)
01	COIN/GAME	1	_____	Number of Coins Required per Game
02	PLAY/GAME	1	_____	Number of Plays per Game
03	POINT/TCKT	3	_____	Number of Points per Ticket (X 10)
04	FREE TCKT	1	_____	Number of Free Tickets
05	MIN TCKT/GM	0	_____	Minimum Number of Tickets per Game
06	MAX TCKT/GM	99	_____	Maximum Number of Tickets per Game
07	BELL TM	15	_____	Bell Time in 0.1 Seconds
08	BEACON TM 30	0	_____	Beacon Time on 0.1 Seconds
09	GM TM	20	_____	Game Time in Seconds
10	MOLE SPD	200	_____	Starting Mole Speed
11	MOLE DN	25	_____	Mole Down Time
12	COIN/BONUS	4	_____	Number of Coins per Bonus 1
13	BONUS VALUE	0	_____	Value of Bonus 1 in Extra Coins
14	BALLY TM	0	_____	Bally Time Register (in Seconds)
15	MIN BEACON	0	_____	Minimum Win Score for Beacon to Run (X 10)
16	MIN BELL	35	_____	Minimum Win Score for Bell to Sound (X 10)
17	LIGHT CHASE	0	_____	Light Chase; Type 0 = Single; 1 = 3 light
18	DISPLAY TYPE	1	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit
19	ST HI SCR	0	_____	Starting High Score (X 10)
20	HI SCR NOTICE	0	_____	High Score Notification
21	ST BONUS	0	_____	Starting High Score (X 10)
22	ADD BTCKT	1	_____	High Score Notification

Game Sound: Bright Ideas Sounds:
One Way or Another! (Rug Rats)
Other Settings: _____
Program Approved For: **BSR** **Release Date: 3/3/2006**

KIDDIE WHAC-A-MOLE
2400 BOARDS
VERSION WAM 24XX
* 3-HEAD *

Reg#	Reg Name	BSR	Actual	Description
00	GAME TYPE		_____	0 = Whac-A-Mole; 1 = Hot Spot/Pattie Cake; 2 = Kiddie Whac-A-Mole (3 head)
01	COIN/GAME	1	_____	Number of Coins Required per Game
02	PLAYS/GAME	1	_____	Number of Plays per Game
03	POINTS/TICKET	10	_____	Number of Points per Ticket
04	FREE TICKETS	0	_____	Number of Free Tickets
05	MIN TICK/GAME	1	_____	Minimum Number of Tickets per Game
06	MAX TICK/GAME	8	_____	Maximum Number of Tickets per Game
07	BELL TIME	20	_____	Bell Time in 0.1 Seconds
08	BEACON TIME	50	_____	Beacon Time on 0.1 Seconds
09	GAME TIME	20	_____	Game Time in Seconds
10	MOLE SPEED	70	_____	Starting Mole Speed
11	MOLE DOWN	25	_____	Mole Down Time
12	COIN/BONUS	4	_____	Number of Coins per Bonus 1
13	BONUS VALUE	0	_____	Value of Bonus 1 in Extra Coins
14	BALLY TIME	60	_____	Bally Time Register (in Seconds)
15	MIN BEACON	10	_____	Minimum Win Score for Beacon to Run
16	MIN BELL	25	_____	Minimum Win Score for Bell to Sound
17	LIGHT CHASE	0	_____	Light Chase Type; 0 = Single; 1 = 3 light
18	DISPLAY TYPE	0	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit

Game Sound: Rocky Theme (File Name: Rockey.vox)
Other Settings: _____

_____

_____

Program Approved For: BSR **Release Date: 3/3/2006**

TODDLER PATTIE CAKES & TODDLER WHAC-A-MOLE VERSION WAM 24XX (2400 BOARDS)

Reg#	BSR	Actual	Description
00	GAME TYPE	_____	1 = Toddler Pattie Cakes; 2 = Toddler Whac-A-Mole (3 head)
01	1	_____	Number of Coins Required per Game
02	1	_____	Number of Plays per Game
03	5	_____	Number of Points per Ticket
04	0	_____	Number of Free Tickets
05	0	_____	Minimum Number of Tickets per Game
06	99	_____	Maximum Number of Tickets per Game
07	20	_____	Bell Time in 0.1 Seconds
08	50	_____	Beacon Time on 0.1 Seconds
09	20	_____	Game Time in Seconds
10	70	_____	Starting Mole Speed
11	25	_____	Mole Down Time
12	4	_____	Number of Coins per Bonus 1
13	1	_____	Value of Bonus 1 in Extra Coins
14	60	_____	Bally Time Register (in Seconds)
15	0	_____	Minimum Win Score for Beacon to Run
16	0	_____	Minimum Win Score for Bell to Sound
17	0	_____	Light Chase Type; 0 = Single; 1 = 3 light
18	1	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit

Program Approved For: BSR **Release Date: 3/3/2006**

ADULT WHAC-A-MOLE
2400 G BOARD
WAM 2401 V-0.5
* 1-PLAYER *

Reg#	Reg Name	BSR	Actual	Description
00	GAME TYPE	0	_____	0 = Whac-A-Mole (Adult, 5 head)
01	COIN/GAME	1	_____	Number of Coins Required per Game
02	PLAYS/GAME	1	_____	Number of Plays per Game
03	POINTS/TICKET	5	_____	Number of Points per Ticket (X 10)
04	FREE TICKETS	0	_____	Number of Free Tickets
05	MIN TICK/GAME	1	_____	Minimum Number of Tickets per Game
06	MAX TICK/GAME	99	_____	Maximum Number of Tickets per Game
07	BELL TIME	20	_____	Bell Time in 0.1 Seconds
08	BEACON TIME	50	_____	Beacon Time on 0.1 Seconds
09	GAME TIME	20	_____	Game Time in Seconds
10	MOLE SPEED	70	_____	Starting Mole Speed
11	MOLE DOWN	20	_____	Mole Down Time
12	COIN/BONUS	4	_____	Number of Coins per Bonus 1
13	BONUS VALUE	0	_____	Value of Bonus 1 in Extra Coins
14	BALLY TIME	60	_____	Bally Time Register (in Seconds)
15	MIN BEACON	0	_____	Minimum Win Score for Beacon to Run (X 10)
16	MIN BELL	0	_____	Minimum Win Score for Bell to Sound (X 10)
17	LIGHT CHASE	0	_____	Light Chase; Type 0 = Single; 1 = 3 light
18	DISPLAY TYPE	1	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit
19	HIGH SCORE	20	_____	Starting High Score (X 10)
20	SCORE NOTICE	1	_____	High Score Notification
21	START BONUS	10	_____	Starting High Score (X10)
22	ADD BTICKET	1	_____	High Score Notification

Game Sound: JACKKNIFE

Other Settings: _____

Program Approved For: **BSR** **Release Date: 3/3/2006**

KIDDIE WHAC-A-MOLE
2400 G BOARD
WAM 2401 V-3
* 1-PLAYER *

Reg#	Reg Name	BSR	Actual	Description
00	GAME TYPE	2	_____	0 = Whac-A-Mole; 1 = Hot Spot/Pattie Cakes; 2 =Kiddie Whac-A-Mole (3 head)
01	COIN/GAME	1	_____	Number of Coins Required per Game
02	PLAYS/GAME	1	_____	Number of Plays per Game
03	POINTS/TICKET	3	_____	Number of Points per Ticket (X 10)
04	FREE TICKETS	1	_____	Number of Free Tickets
05	MIN TICK/GAME	0	_____	Minimum Number of Tickets per Game
06	MAX TICK/GAME	99	_____	Maximum Number of Tickets per Game
07	BELL TIME	0	_____	Bell Time in 0.1 Seconds
08	BEACON TIME	0	_____	Beacon Time on 0.1 Seconds
09	GAME TIME	20	_____	Game Time in Seconds
10	MOLE SPEED	70	_____	Starting Mole Speed
11	MOLE DOWN	25	_____	Mole Down Time
12	COIN/BONUS	4	_____	Number of Coins per Bonus 1
13	BONUS VALUE	0	_____	Value of Bonus 1 in Extra Coins
14	BALLY TIME	0	_____	Bally Time Register (in Seconds)
15	MIN BEACON	0	_____	Minimum Win Score for Beacon to Run (X 10)
16	MIN BELL	0	_____	Minimum Win Score for Bell to Sound (X 10)
17	LIGHT CHASE	0	_____	Light Chase; Type 0 = Single; 1 = 3 light
18	DISPLAY TYPE	1	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit
19	HIGH SCORE	0	_____	Starting High Score (X 10)
20	SCORE NOTICE	0	_____	High Score Notification

Game Sound: Kiddie Whac-A-Mole: Rocky Theme (File Name: rockey.vox)

Other Settings: _____

_____

_____

Program Approved For: BSR/CEC **Release Date: 3/3/2006**

PATTIE WHAC TODDLER
2400 G BOARD
WAM 2401 V-3
* 1-PLAYER *

Reg#	Reg Name	BSR	Actual	Description
00	GAME TYPE	2	_____	0 = Whac-A-Mole; 1 = Hot Spot/Pattie Cakes; 2 =Kiddie Whac-A-Mole (3 head)
01	COIN/GAME	1	_____	Number of Coins Required per Game
02	PLAYS/GAME	1	_____	Number of Plays per Game
03	POINTS/TICKET	3	_____	Number of Points per Ticket (X 10)
04	FREE TICKETS	1	_____	Number of Free Tickets
05	MIN TICK/GAME	0	_____	Minimum Number of Tickets per Game
06	MAX TICK/GAME	99	_____	Maximum Number of Tickets per Game
07	BELL TIME	0	_____	Bell Time in 0.1 Seconds
08	BEACON TIME	0	_____	Beacon Time on 0.1 Seconds
09	GAME TIME	20	_____	Game Time in Seconds
10	MOLE SPEED	90	_____	Starting Mole Speed
11	MOLE DOWN	70	_____	Mole Down Time
12	COIN/BONUS	4	_____	Number of Coins per Bonus 1
13	BONUS VALUE	0	_____	Value of Bonus 1 in Extra Coins
14	BALLY TIME	0	_____	Bally Time Register (in Seconds)
15	MIN BEACON	0	_____	Minimum Win Score for Beacon to Run (X 10)
16	MIN BELL	0	_____	Minimum Win Score for Bell to Sound (X 10)
17	LIGHT CHASE	0	_____	Light Chase; Type 0 = Single; 1 = 3 light
18	DISPLAY TYPE	0	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit
19	HIGH SCORE	0	_____	Starting High Score (X 10)
20	SCORE NOTICE	0	_____	High Score Notification

Game Sound: Pattie Whac-A-Mole: ABC (File Name: abc.vox)

Other Settings: _____

_____

_____

Program Approved For: BSR **Release Date: 3/3/2006**

WHAC-A-MOLE
2400 G BOARD
WAM 2401 V-3

Reg#	Reg Name	BSR	Actual	Description
00	GAME TYPE		_____	0 = Whac-A-Mole (Adult, 5 head); 1 = Pattie Whac-A-Mole (5 head); 2=Kiddie/Toddler Whac-A-Mole (3 head) & Toddler Pattie Whac-A-Mole (3 head)
01	COIN/GAME	1	_____	Number of Coins Required per Game
02	PLAYS/GAME	1	_____	Number of Plays per Game
03	POINTS/TICKET	5	_____	Number of Points per Ticket (X 10)
04	FREE TICKETS	0	_____	Number of Free Tickets
05	MIN TICK/GAME	0	_____	Minimum Number of Tickets per Game
06	MAX TICK/GAME	99	_____	Maximum Number of Tickets per Game
07	BELL TIME	20	_____	Bell Time in 0.1 Seconds
08	BEACON TIME	50	_____	Beacon Time on 0.1 Seconds
09	GAME TIME	20	_____	Game Time in Seconds
10	MOLE SPEED	70	_____	Starting Mole Speed
11	MOLE DOWN	25	_____	Mole Down Time
12	COIN/BONUS	4	_____	Number of Coins per Bonus 1
13	BONUS VALUE	1	_____	Value of Bonus 1 in Extra Coins
14	BALLY TIME	60	_____	Bally Time Register (in Seconds)
15	MIN BEACON	0	_____	Minimum Win Score for Beacon to Run (X 10)
16	MIN BELL	0	_____	Minimum Win Score for Bell to Sound (X 10)
17	LIGHT CHASE	0	_____	Light Chase; Type 0 = Single; 1 = 3 light
18	DISPLAY TYPE	1	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit
19	HIGH SCORE	0	_____	Starting High Score (X 10)
20	SCORE NOTICE	0	_____	High Score Notification

Game Sound: Whac-A-Mole Adult: Can't Touch This (File Name: cantouch.vox); Whac-A-Mole Kiddie: Rocky Theme (File Name: rockey.vox); Whac-A-Mole Toddler: Pop! Goes The Weasel (File Name: pgw.vox); Pattie Whac-A-Mole: ABC (File Name: abc.vox)

Other Settings: _____

Program Approved For: BSR **Release Date: 3/3/2006**

WHAC-A-MUNCH/PATTIE WHAC
2400 G BOARD
WAM 2401 V-3

Reg#	Reg Name	BSR	Actual	Description
00	GAME TYPE		_____	0 = Whac-A-Mole (Adult, 5 head); 1 = Pattie Whac-A-Mole (5 head); 2=Kiddie/Toddler Whac-A-Mole (3 head) & Toddler Pattie Whac-A-Mole (3 head)
01	COIN/GAME	1	_____	Number of Coins Required per Game
02	PLAYS/GAME	1	_____	Number of Plays per Game
03	POINTS/TICKET	5	_____	Number of Points per Ticket (X 10)
04	FREE TICKETS	0	_____	Number of Free Tickets
05	MIN TICK/GAME	0	_____	Minimum Number of Tickets per Game
06	MAX TICK/GAME	99	_____	Maximum Number of Tickets per Game
07	BELL TIME	20	_____	Bell Time in 0.1 Seconds
08	BEACON TIME	50	_____	Beacon Time on 0.1 Seconds
09	GAME TIME	20	_____	Game Time in Seconds
10	MOLE SPEED	70	_____	Starting Mole Speed
11	MOLE DOWN	25	_____	Mole Down Time
12	COIN/BONUS	4	_____	Number of Coins per Bonus 1
13	BONUS VALUE	1	_____	Value of Bonus 1 in Extra Coins
14	BALLY TIME	60	_____	Bally Time Register (in Seconds)
15	MIN BEACON	0	_____	Minimum Win Score for Beacon to Run (X 10)
16	MIN BELL	0	_____	Minimum Win Score for Bell to Sound (X 10)
17	LIGHT CHASE	0	_____	Light Chase; Type 0 = Single; 1 = 3 light
18	DISPLAY TYPE	1	_____	Display Type; 0 = 2 Digit; 1 = 3 Digit
19	HIGH SCORE	0	_____	Starting High Score (X 10)
20	SCORE NOTICE	0	_____	High Score Notification

Game Sound: Whac-A-Mole Adult: Can't Touch This (File Name: cantouch.vox); Whac-A-Mole Kiddie: Rocky Theme (File Name: rockey.vox); Whac-A-Mole Toddler: Pop! Goes The Weasel (File Name: pgw.vox); Pattie Whac-A-Mole: ABC (File Name: abc.vox)

Other Settings: _____

Program Approved For: BSR **Release Date: 3/3/2006**

NOTE: We recommend you write your settings in the "Actual" column for future reference. Your settings can be different depending on coins per game, number of tickets, etc.

A NOTE ON BONUS COINS:

To be compatible with multi-coin systems and dollar bill acceptors around, this game is equipped with bonus levels for additional coins. If you want customers to put in a dollars worth of coins (or a dollar bill) instead of just a 25 cent piece, set bonus level to 4 (4-25 cent coins = 1 dollar). Then set the bonus coins to a number greater than zero. If it was set on 1, then 4 coins would be the same as putting in 5 coins, one after each game. To get the bonus, all coins need to be put in before a game is played. Once a game is played, the bonus level starts from zero.

MAINTENANCE

GENERAL MAINTENANCE INFORMATION

Your pride is reflected by the cleanliness and flash. A good game with good flash will make money. The very best game, if not clean or properly flashed, will be easily passed by. Remember, no one can enjoy the game until they have played it. Proper maintenance is extremely important for good game operation and profitable stock averages.

Clean all Laminated surfaces **daily** (see chart below).

TO CLEAN GAMES

You may use soapy water on Formica, Plexi-glass, regular glass, Stainless Steel, and other metals without causing any damage. The following list of cleaners can only be used on the materials they are listed with. If a cleaner is used on a material that it is not listed with it will cause damage to that material and Bob's Space Racers® will not be held responsible for repair and/or replacement of that damaged material.

Cleaner	**Material**
Lacquer Thinner	Formica; regular glass
Mineral Spirits	Formica; Plexi-glass; Stainless Steel; other metals
Clean-On-The-Go Glass and Hard Surface Cleaner™	Formica; regular glass; Stainless Steel; other metals
De-Solve-It®	Formica; Plexi-glass
Brillianize™	Plexi-glass; regular glass
Windex®	regular glass
3812S Enamel Reducer	Plexi-glass
Soft Scrub®; CLR®; Lime Away®	Stainless Steel; other metals
Old English® Oil; Baby Oil	Formica; Stainless Steel; other metals

AIR PRESSURE ADJUSTMENT

The air pressure coming from the tank and into the game needs to be regulated air. The air which goes into the game should be regulated by a pressure gauge. You can adjust this pressure by the pressure regulator knob. The air pressure needs to be the minimum possible. Adjust the pressure down so the heads barely come up. Keep adjusting the pressure up so the heads come up a little higher each time. The maximum pressure should be when all the heads reach their fullest extent; this will vary depending on each game unit. If you need assistance, please call, Bob's Space Racers at 386-677-0761, and ask for a technician.

GAME SPECIFIC MAINTENANCE

Daily

1. Check oil (The compressor uses 30 weight non-detergent, and the FRL uses10 weight non-detergent.)
2. Check dryer and drain, if necessary.
3. Visually inspect game for debris (under heads & inside holes).
4. Check bulbs.
5. Clean Formica.
6. Start each unit and check for score on each figure head.

Weekly

1. Drain air tank.
2. Clean cooling surfaces of compressor.
3. Remove countertops:
   - Inspect micro-switches and attached wires
   - Check wires at terminal block strips
   - Check tightness of all bolts and nuts in mole assembly
   - Check hammers and adjust ropes (so hammer doesn't touch mirror)
4. Lemon oil all Formica.
5. Blow out the optic sensor on your ticket dispenser board.
6. Lubricate mole shaft with Lithium grease. NOTE: **Do not** lubricate if the mole brackets have Oilite Bushings (they are self-lubricating).

Monthly

1. Operate safety valves on compressor or tank.
2. replace or clean air filter.
3. check belt tensions on compressor
4. check pulley clamp bolt and set screws.
5. inspect air lines, rubber and PVC.

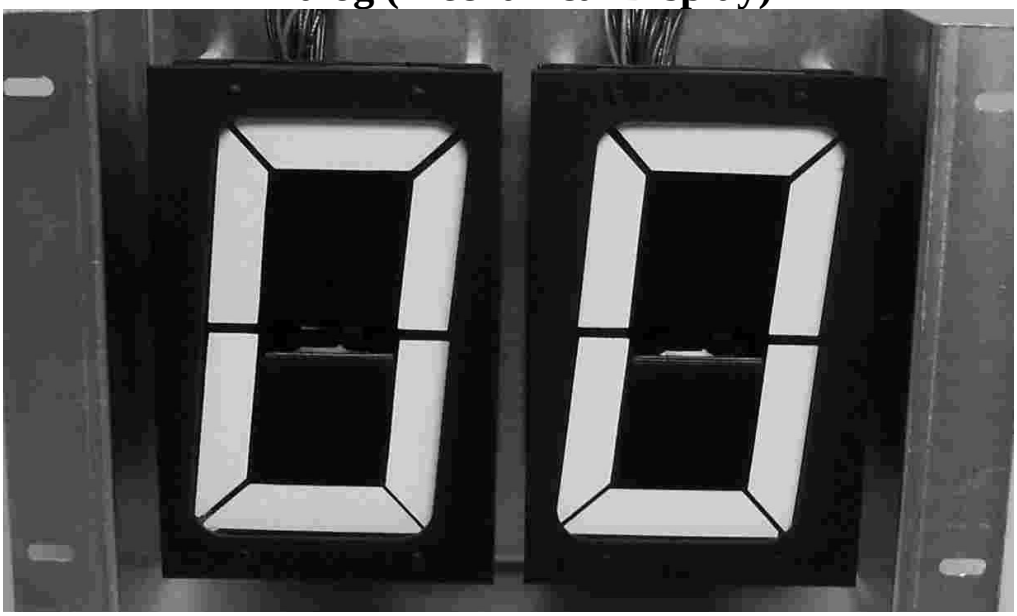
Semi-annually (twice a year)

1. inspect valve assemblies.
2. check pressure hoses from compressor to tank.
3. check discharge line for carbon build-up.
4. check contact points in pressure switch.
5. Lubricate electric motor.

TECHNICAL DATA

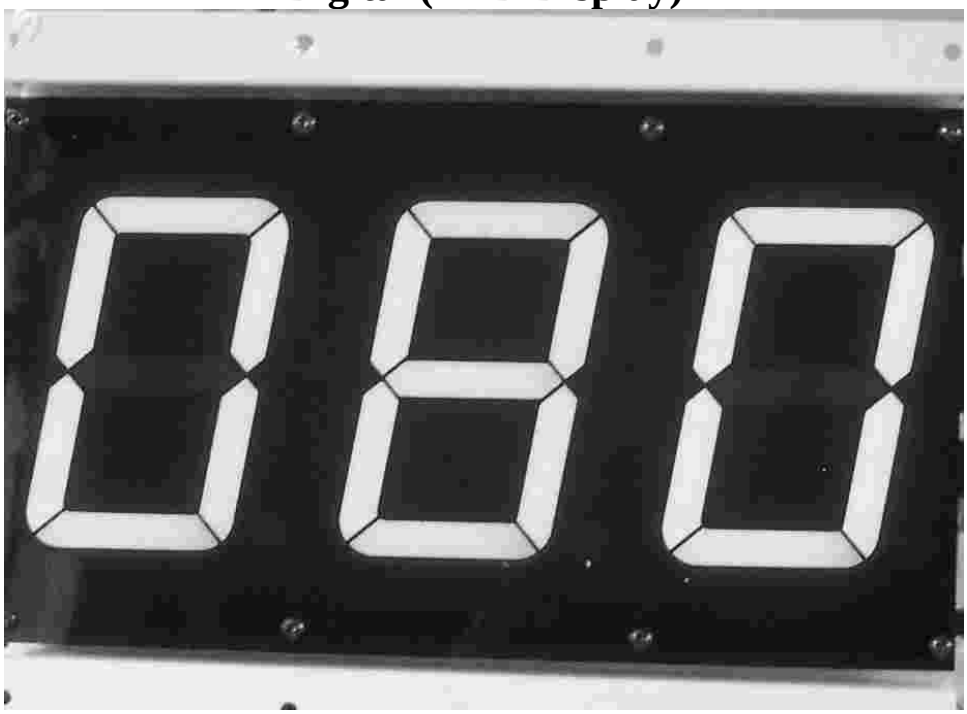
SCORE DISPLAY BOARDS

Analog (Mechanical Display)



Note: This is black and white in color.

Digital (LED Display)



Note: This is red in color.

2400 SERIES ELECTRONICS

2400 BOARD ELECTRONICS OVERVIEW

In 1999 Bob's Space Racers® introduced the 2400 Series Electronics Board. It is very similar to the 2300 Series Electronics Board but with several major improvements. With the 2400 Board Electronics it is easier to program. Also, the failure of one board will not take the entire game down as it would if one board failed in the 2300 Board Electronics.

2400 MICROPROCESSOR BOARD OVERVIEW

The basic operation of the processor board is as follows.

The inputs on this board are on J9. The J9 connector inputs are ground-seeking. The row of pins closest to the edge of the board is at ground and the row in towards the board is the actual input pins. To check an input, simply ground the input's corresponding pins and the corresponding LED should light up – if good. These LED's are tied to opto-couplers which convert the 12 volt circuit to TTL for the board.

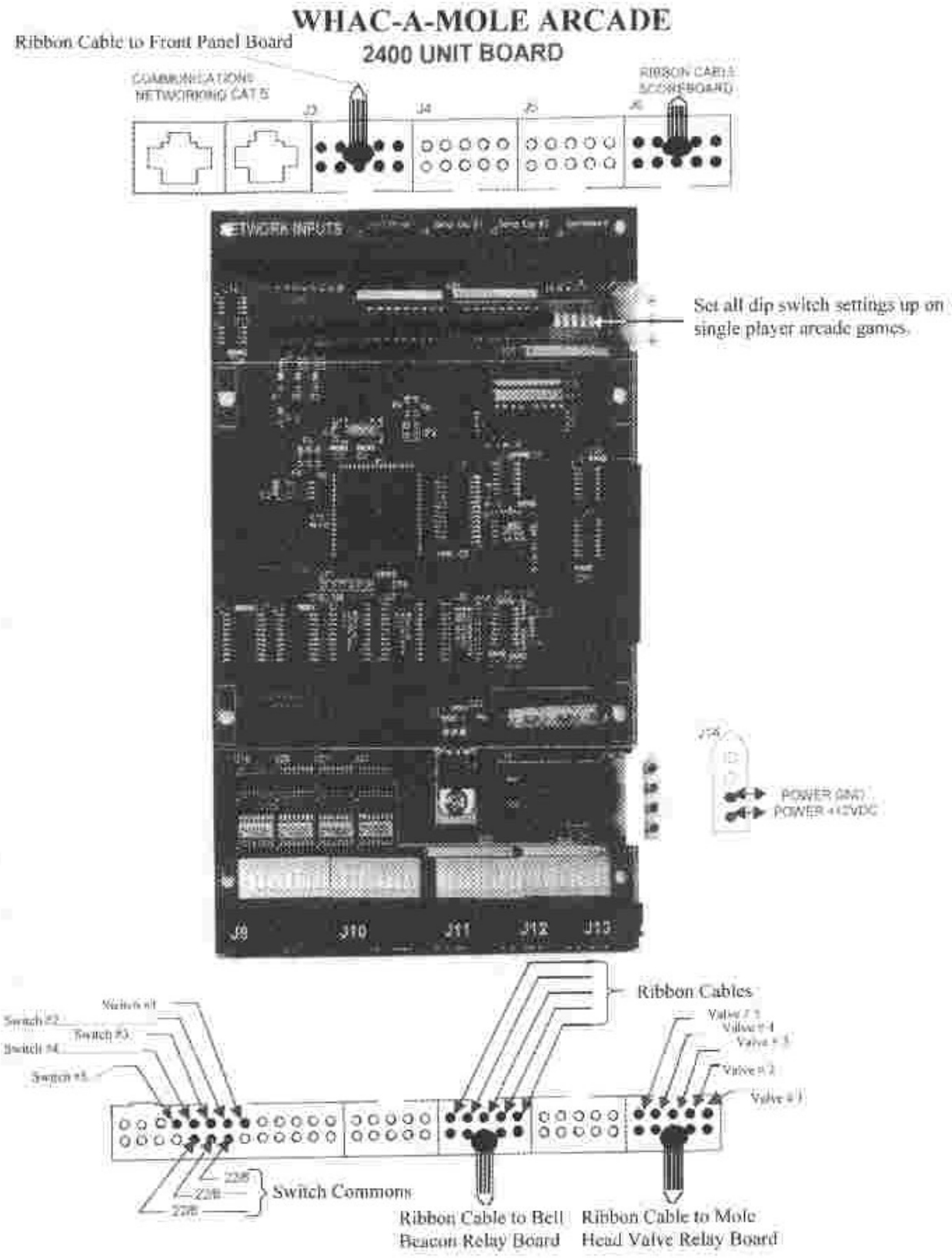
The output connectors, J10 through J13, are open collector to ground,
. If the LED is on, the output is working because they are tied directly to the output pin. DO NOT ever short a front and back row pin on the output connector together. If the output was good, it isn't anymore!

The 4-pin Molex connector is the +12V (pin 4) and ground (pins 2 and 3) power input to the board.

The two (2), RJ-45 connectors at the upper left corner of the board, are communication ports to other boards and systems, and are wired in parallel.

There is a row of serial expansion connectors that are used to communicate with serial devices, such as the front panel board, credit display, etc. There is a total of four (4) connectors, only three (3) of these ports are being used at this point. The other two (2) are for future use.

There is an 18-position SIP header connector. This is an 8-bit, clocked parallel TTL port. It is set up to be used for a sound board to plug 'piggyback' on top of this board.


WHAC-A-MOLE ARCADE
2400 UNIT BOARD
Ribbon Cable to Front Panel Board
COMMUNICATIONS NETWORKING CAT 5
RIBBON CABLE SCOREBOARD
J3
J4
J5
J6
NETWORK INPUTS
Set all dip switch settings up on single player arcade games.
J26
POWER GND
POWER +12VDC
J8
J10
J11
J12
J13
Ribbon Cables
Switch #1
Switch #2
Switch #3
Switch #4
Switch #5
Valve #1
Valve #2
Valve #3
Valve #4
Valve #5
Switch Commons
Ribbon Cable to Bell Beacon Relay Board
Ribbon Cable to Mole Head Valve Relay Board

CREDIT DISPLAY BOARD OVERVIEW

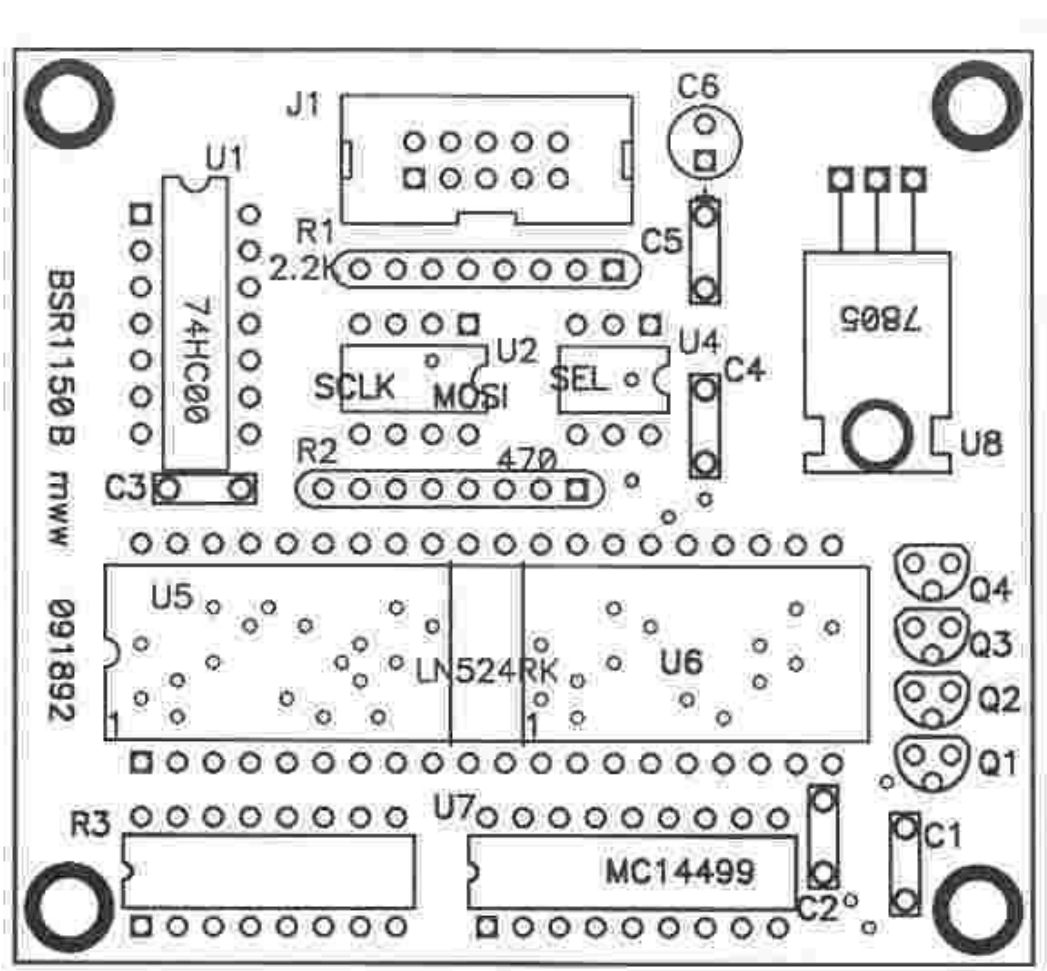
The basic operation of the Credit Display Board is as follows.

The Credit Display Board is used to show the Player how many coins or tokens are required for a play and how many credits are remaining. The Credit Display Board, when used in conjunction with the Front Panel Board, will display the Option Registers and the contents of that register, when needed.

The only connector on the Board is a 10-Pin Ribbon Cable Connector that connects the Credit Display to the Front Panel Board or directly to the 2400 Microprocessor Board.

***The Credit Display Board is <u>not</u> used to set Options on multi-player games. See OPTION REGISTERS - 2400 SERIES on how to change Registers and the contents thereof.**

CREDIT DISPLAY DIAGRAM



FRONT PANEL BOARD OVERVIEW

The basic operation of the Front Panel Board is as follows.

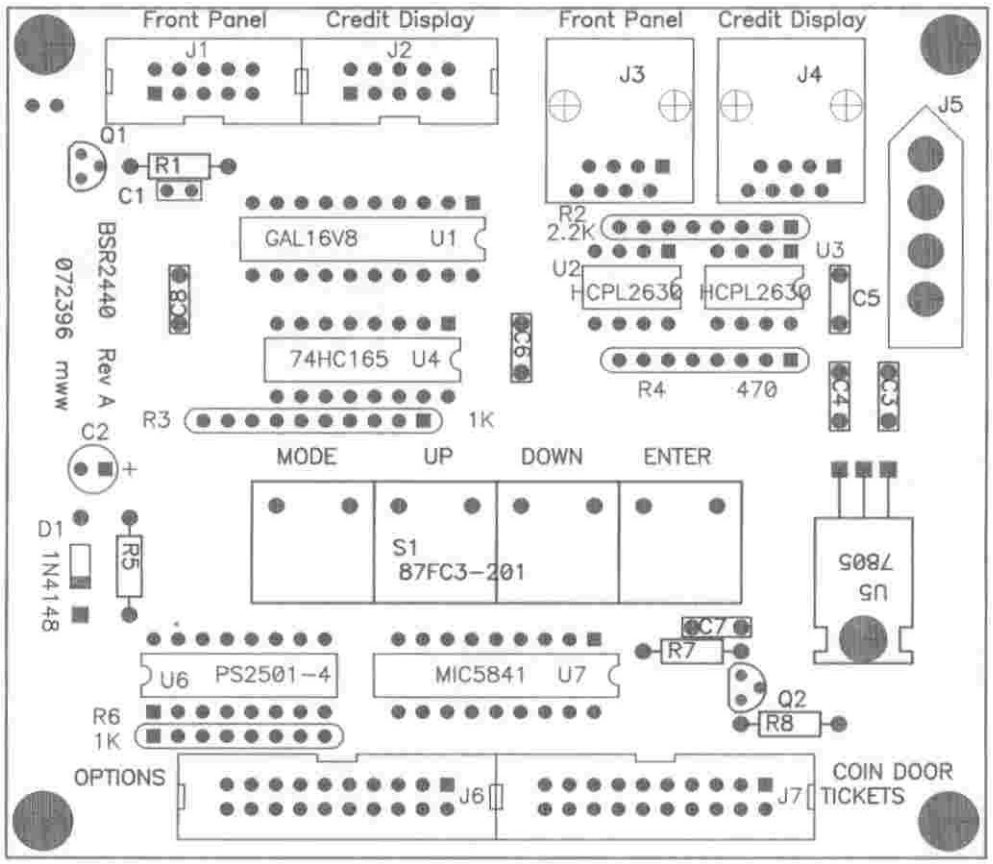
The Front Panel Board is used as a distribution point for the Credit Display Board and gives the customer the ability to change the Option Registers via the four (4) pushbutton switches.

The two 20-Pin Connectors (J6 and J7) are Expansion Inputs and Outputs via the Main Processor. One of the 20-Pin Connectors is the Coin Door and Ticket Dispenser Connections. The other 20-Pin Connector is labeled 'options' and will be used at a later date.

The 4-Pin Molex Connector (J5) supplies +12VDC (Pin 4) and Ground (Pins 2 & 3) to the Board.

The top two 10-Pin Ribbon Cable Connectors (J1 and J2) are Input/Output Connectors--one from the 2400 Board and one from the Credit Display.

FRONT PANEL BOARD DIAGRAM



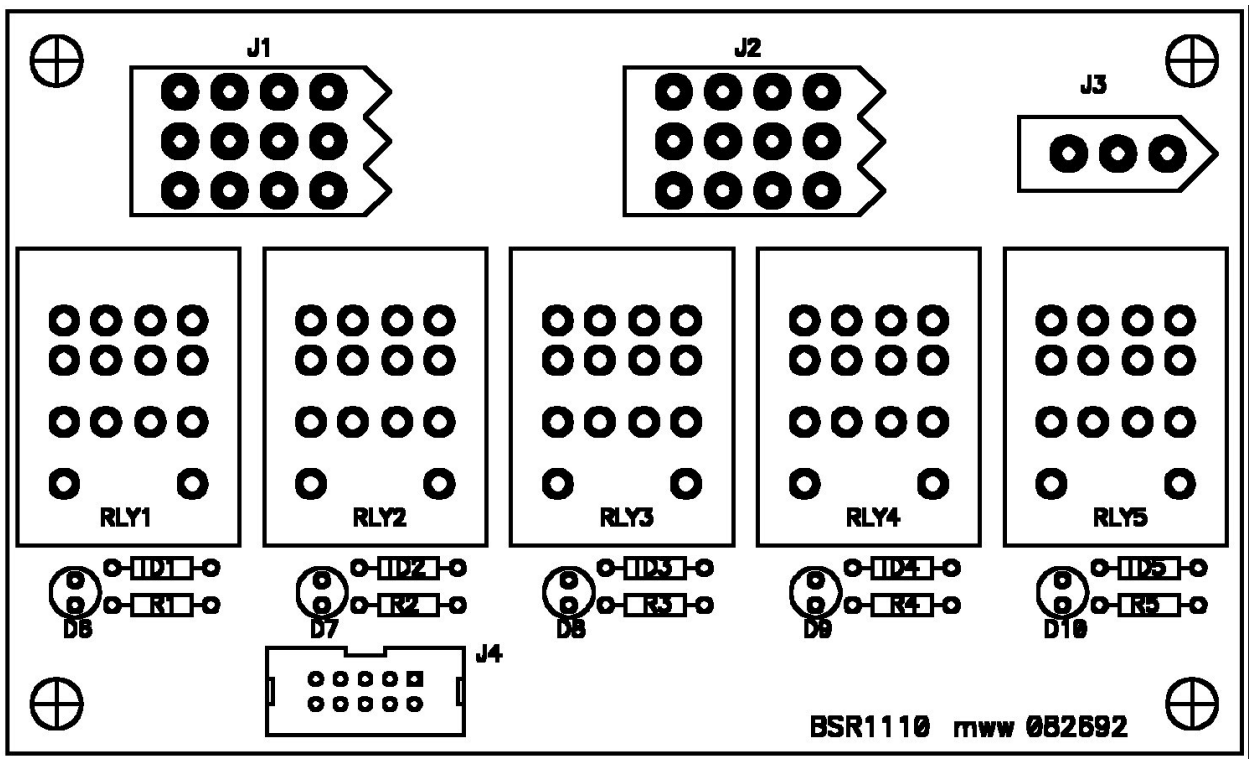
RELAY BOARDS
Overview and Diagrams

There are three (3) styles of relay boards, and the style of relay board used depends on the application. The coil voltage comes in on a 10-pin ribbon cable connection to turn the relay(s) ON or OFF. The LED's on the board signal when a relay is ON or OFF. The different styles of relay boards are as follows.

This game uses the following style(s):

BSR1110

On this relay board there are two (2) 12-pin Molex plugs and one (1) 3-Pin Molex plug. The Molex plugs bring out the contacts of the relay(s), (common, N/O, and N/C). These are used for any voltage level or general application.

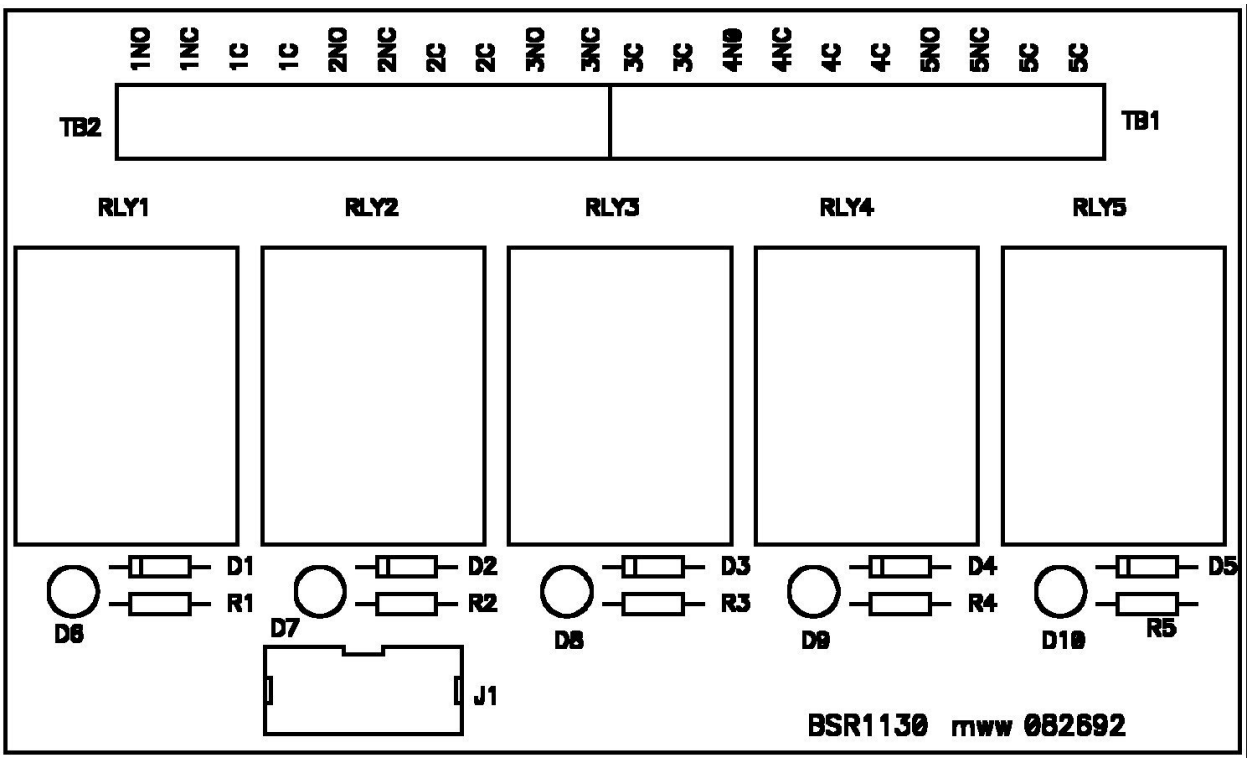


RELAY BOARDS

(CONTINUED)

BSR 1130

This style of relay board is currently not used. There is a 20-position terminal bock (to replace the style with the Molex plugs). By using the terminal block, it brings out the form C Switch contacts for each relay. There are four (4) terminal block positions for each relay. Two (2) are common, one (1) is N/O, and the other is N/C. There are two (2) common positions for each relay so we can daisy-chain the power to all of the commons, if necessary.



TROUBLESHOOTING: 2400 ELECTRONICS

PROBLEMS/CAUSES	SUGGESTED FIX
PROBLEMS WITH BEACON	
Beacon Light Works, but the Disk Does Not Revolve	
Reflector is Slipping	Check the motor to see if it is slipping – adjust if necessary. There is a tension wheel that pushes an o-ring (found around the disk) tight to the motor shaft. Adjust if the tension wheel is not pushing down hard enough on the o-ring.
Beacon Light Does Not Work, but the Disk is Revolving	
Bad Bulb	Check bulb and replace if necessary.
Beacon Does Not Work At All	
No Power	If the bell is not working, then the problem is in a board. Check voltage to relay board (12V DC).
Bad Wire Connection(s)	If the bell is working, then check all wiring to and from the beacon.
Bad Relay	Check relay on relay board for proper operation.
PROBLEMS WITH THE BELL	
Bell Does Not Work At All	
No Power	Check voltage to relay board (12V DC). Check wiring.
Bad Relay	Swap relay with another one, if problem follows, then replace bad one.

TROUBLESHOOTING: 2400 ELECTRONICS

(CONTINUED)

PROBLEMS/CAUSES	SUGGESTED FIX
PROBLEMS WITH THE SCORE DISPLAY	
Score Display and/or Best Score of the Day Does Not Work At All	
Loose Wire Connections	Check all ribbon cable connections from the display to the 2400 control board (labeled 'Control Board'). Check ribbon cables from one display to another.
No Power	Check for 12V DC from the red wire to the black wire on the 4-pin Molex connector on the board.
Display Does Not Advance Correctly	
'Head Hit' Input on Control Board Does Not Work	Check input LED's on the 2400 controller board for proper operation.
Sensor for a Particular Mole Head and/or Air Head Does Not Work	Check sensor switch. ?**? Hose. See 'Heads Not Scoring'.
PROBLEMS WITH THE GAME	
Game Will Not Coin Up	
Bad Coin Switch	Ohm out the coin switch and replace if necessary.
Loose Connection	Check the 20-pin connector on the front panel board for good connection. Check the ribbon cable from the board to the 2400 controller board.
Bad IC/Board	Swap front panel board with a unit board.
Unit Coins Up By Itself	
Bad Coin Switch	Ohm out the coin switch and replace if necessary.

TROUBLESHOOTING: 2400 ELECTRONICS

(CONTINUED)

PROBLEMS/CAUSES	SUGGESTED FIX
PROBLEMS WITH THE GAME	
Unit Coins Up By Itself	
Wire in the Wrong Place	Check wiring to the 20-pin connector on the front panel board for their proper locations.
Wrong Register Setting	Check appropriate register for number of tries per credit. See OPTION REGISTER SHEET (in section above this).
Credit Display Board Will Not Accept Changes From the Front Panel Board	
Bad Connection	Check ribbon cables from credit display board back to the main board.
Bad Board	Swap board with another one that is known to be good.
Bad IC	Change 2803 IC next to front panel connector on the 2400 board.
FRONT PANEL BOARD WILL NOT ALLOW YOU TO CHANGE REGISTER SETTINGS	
No Power	Check voltage on the 4-pin Molex plug for 12V DC.
No Connection	Check ribbon cable on the left side of the board back to the 2400 board.
Bad Board	Swap board with another one that is known to be good.
No Sound	
No Connection	Check wiring from the speaker to the 2400 board.

TROUBLESHOOTING: 2400 ELECTRONICS

(CONTINUED)

PROBLEMS/CAUSES	SUGGESTED FIX
PROBLEMS WITH THE GAME	
No Sound	
Volume POT Too Low	Adjust POT on the sound board (found near largest heat sink).
Bad Sound Board	Swap sound boards.
Blows 7 ½ Amp Fuse	
Wrong Value Fuse	Should be a 7 ½ Amp fast-acting fuse.
Short In The Wiring	Unplug all 12V DC power connections. Plug them in one at a time to determine which board has the short.
No Power To The 2400 Board	
No Connection	Check wiring from 2400 board to the 12V power supply.
Bad Power Supply	Check the 12V output from the 12V power supply, make certain the game power is on. Check the 120V AC input and replace if necessary.

WHAC-A-MOLE BOX ELECTRONICS

WHAC-A-MOLE BOX

Over the years there have been improvements made to the Mole Box in reliability and longevity.

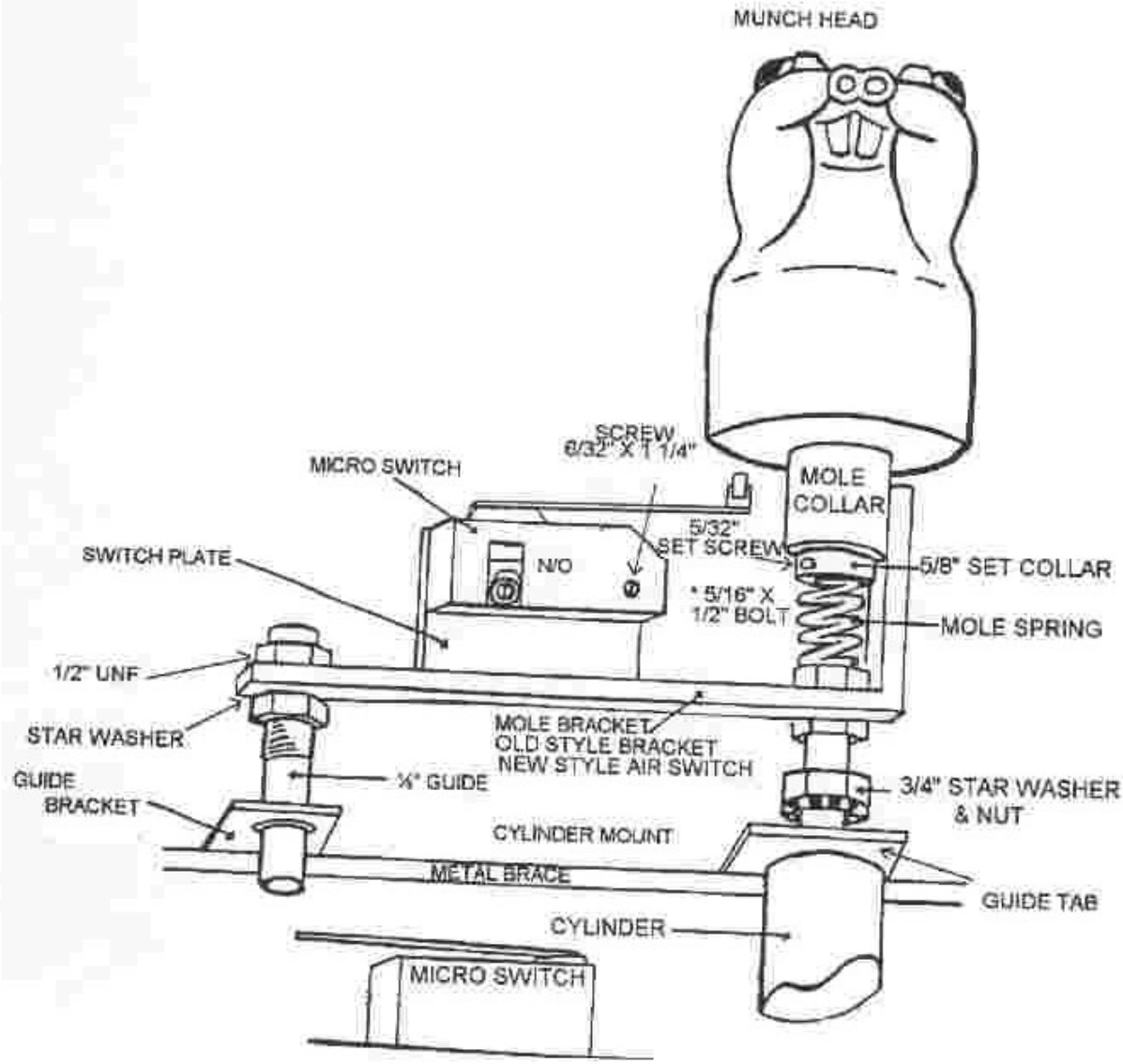
The original versions used two (2) switches wired in series. One switch located under the Mole (a normally open switch) which would close when the Mole was hit. The other switch located under the guide pin (a normally closed switch) which would open when the air cylinder was down. The circuit for the two switches was fairly simple. The only time a player could score was when the air had filled the cylinder (the bottom switch is now closed), and the player hit the raised Mole (closing the top switch) thus completed the circuit through both switches.

The main problem with this design was that there are many parts associated with mounting a switch. Often when a repair is done, parts were left off. The wires going to the switches had a tendency to break, which caused the Mole to score all of the time or not at all. The parts that prevented this are crimp terminals with a strain relief on the wire and a cable clamp to strain relief the wire by attaching the wire to the switch housing.

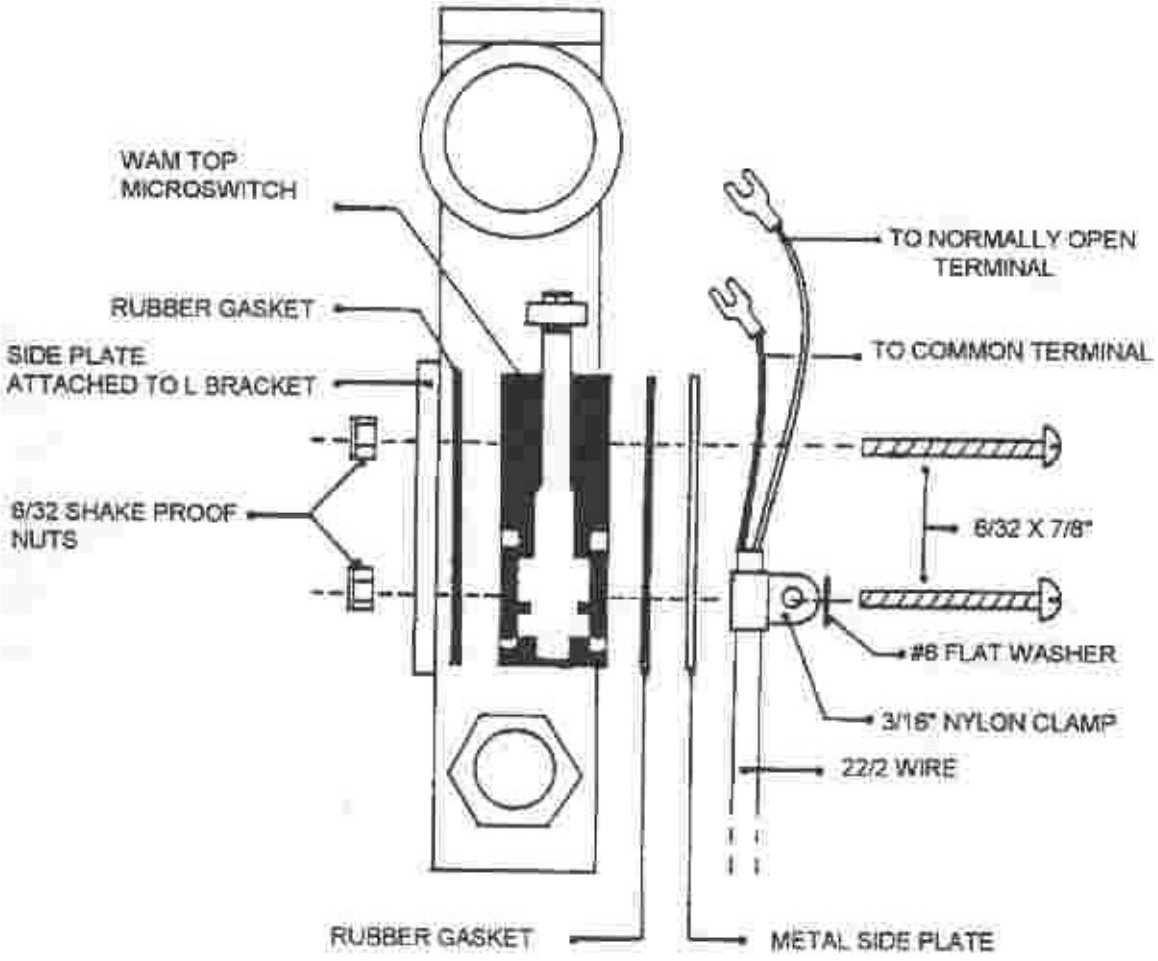
The current version looks very similar, but the operation is quite different. Instead of two switches, we now use an air switch under the Mole heads and an air pressure sensing switch that senses when the Mole has been hit. This system uses the air that fills the air cylinder and we plumb it into an air switch that is located under the Mole body. With the cylinder up, there is air pressure on one side of the switch. When the Mole is hit the switch will open and allow air to pass through the switch and down to a manifold. All of the switches are connected to this manifold which, in turn, is connected to the air pressure sensing switch. The air pressure pulse will pass down from the manifold to the sensing switch. Once the switch has an air pressure pulse it will make an internal switch closure and will cause an input to activate on the processor board.

With either set-up there is a rubber gasket on both sides of the switch (under the head) and these parts are sandwiched between a metal plate on the outside and the Mole bracket on the other side. The fastening nuts are 6/32 shake-proof nuts. This allows you to only snug the nuts instead of pressurizing the switch, thus providing a shock mount for the switch.

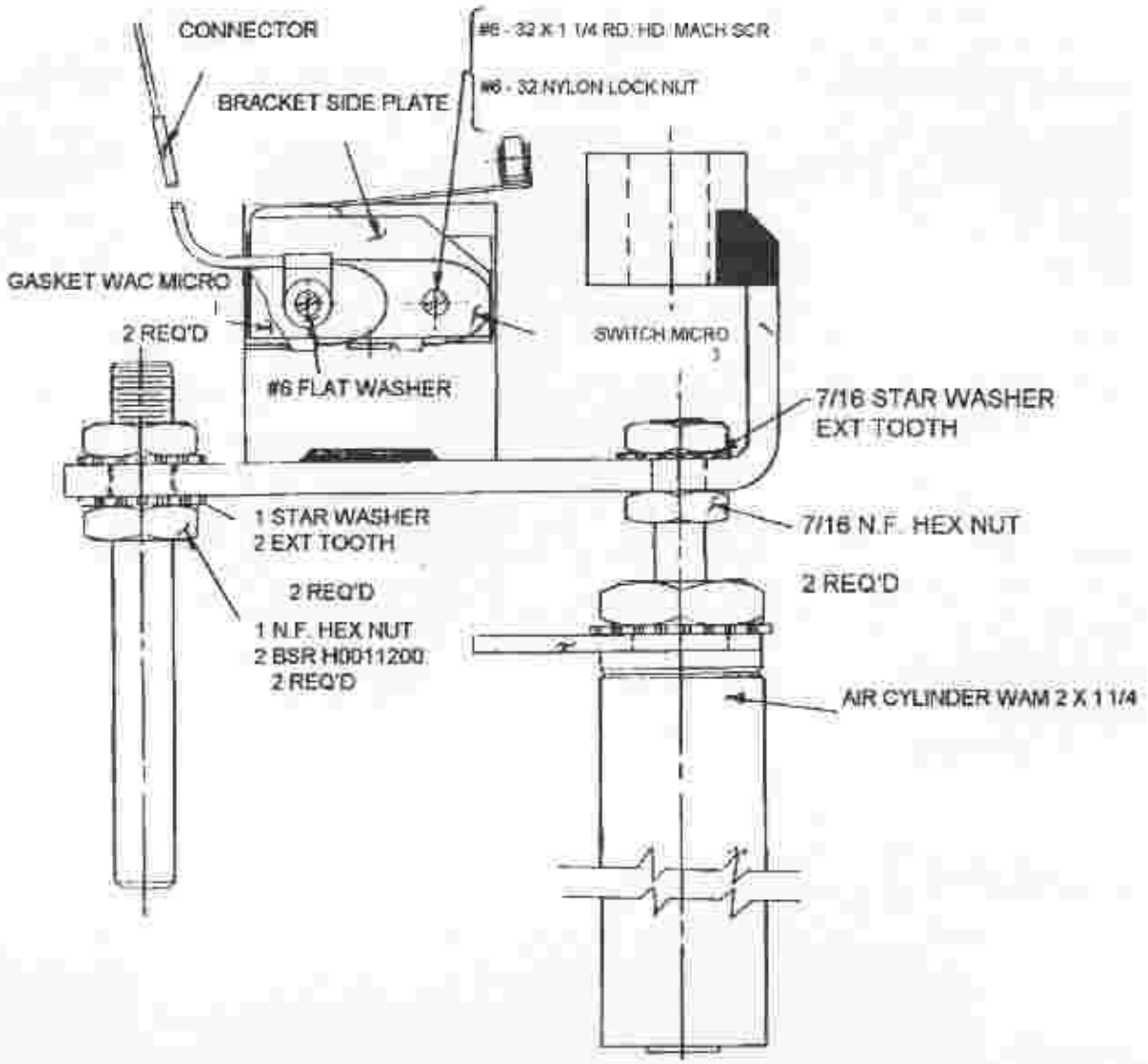
OLD STYLE MOLE BRACKET WITH ELECTRIC SWITCHES



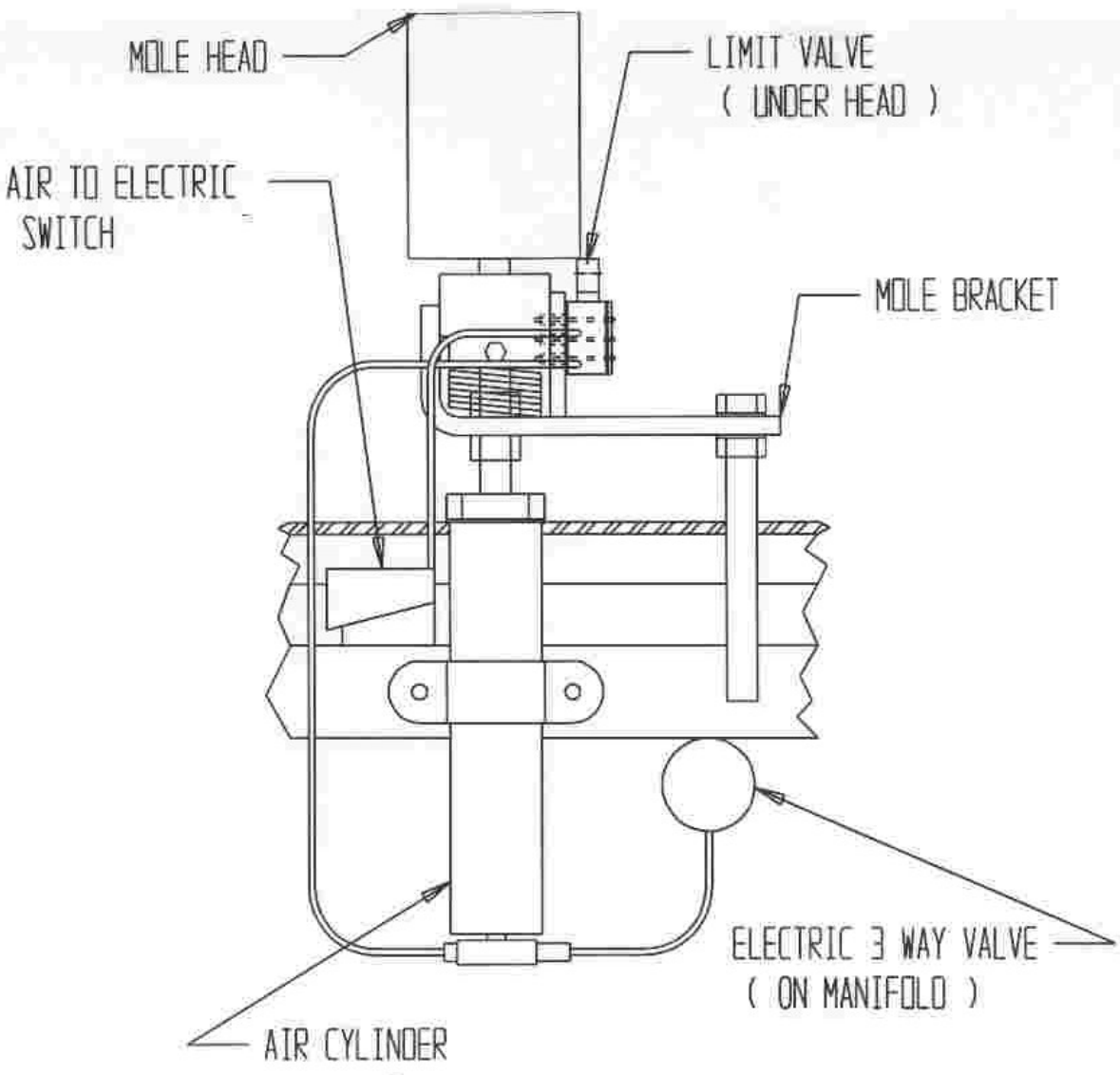
OLD STYLE SCORE SWITCH



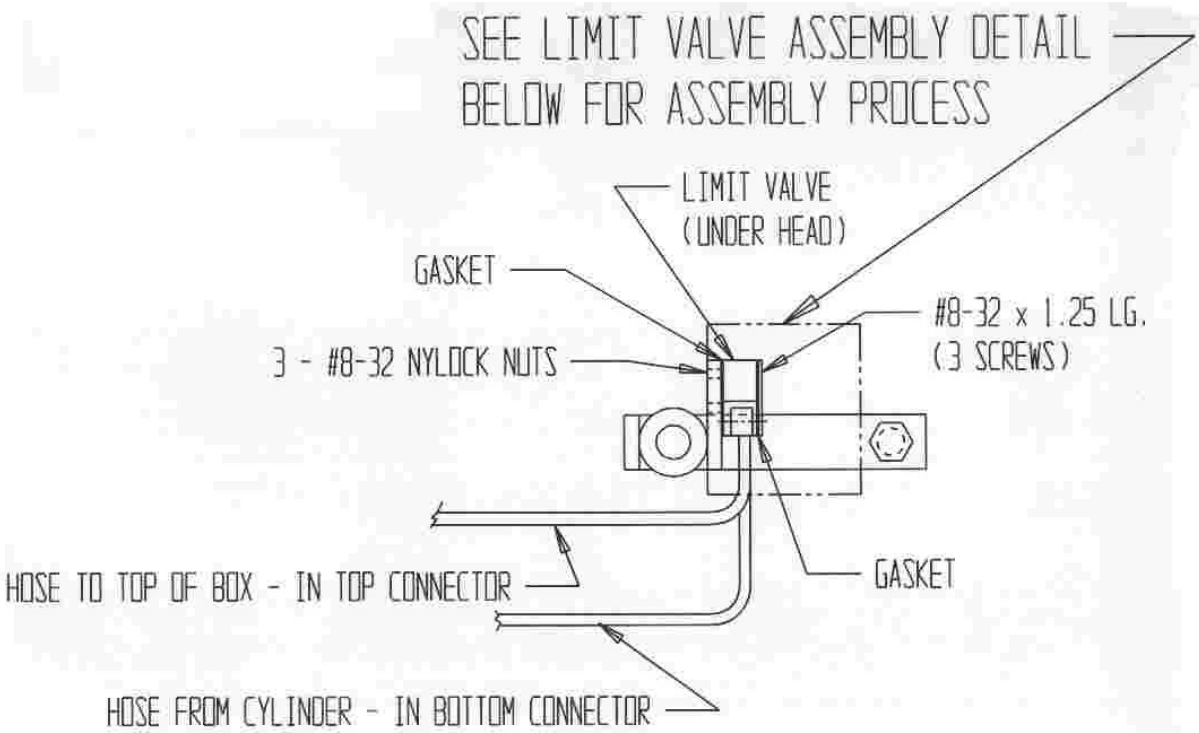
OLD STYLE WHAC-A-MOLE BRACKET ASSEMBLY



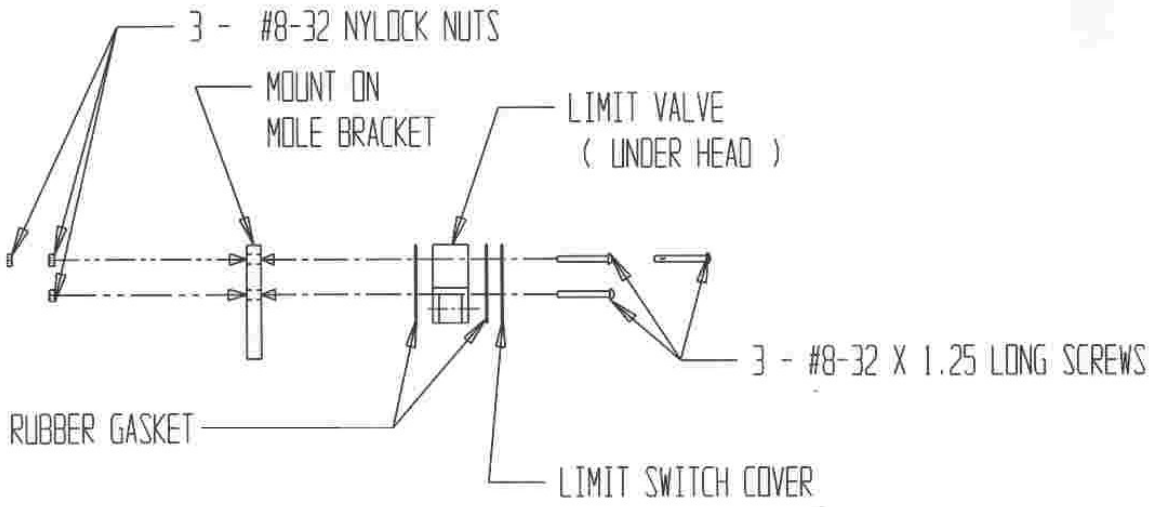
WHAC-A-MOLE BRACKET ASSEMBLY WITH LIMIT VALVES



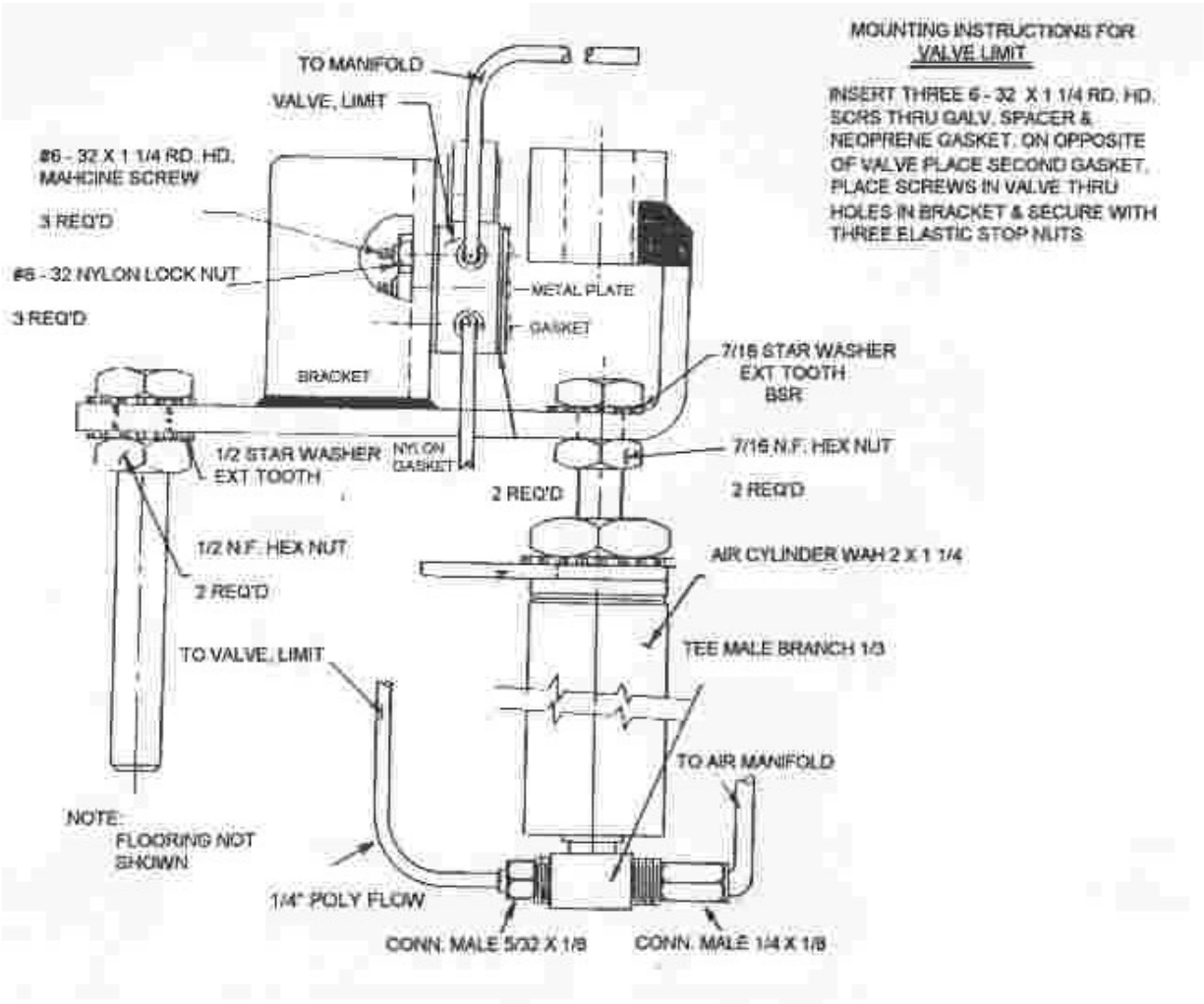
TOP LIMIT VALVE ASSEMBLY



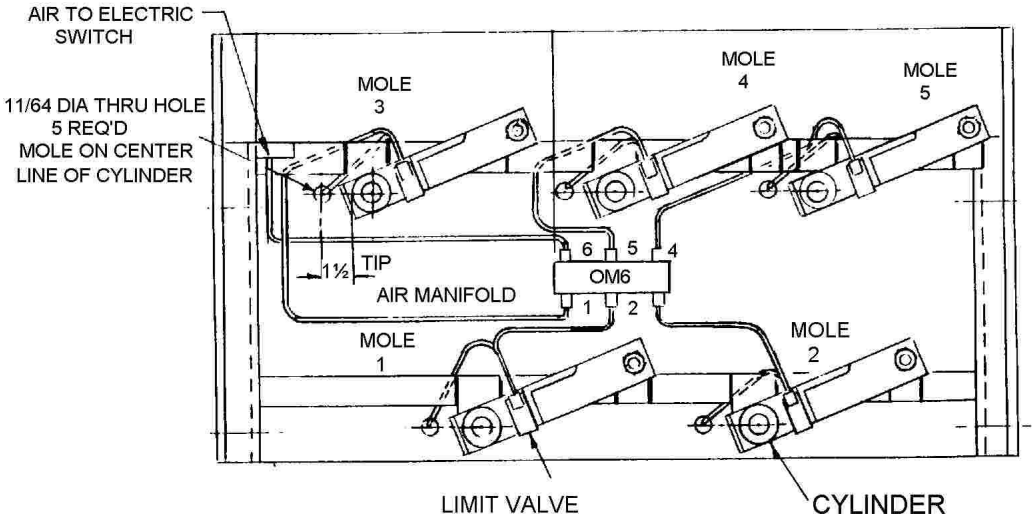
LIMIT VALVE ASSEMBLY DETAIL



NEW STYLE WHAC-A-MOLE BRACKET ASSEMBLY

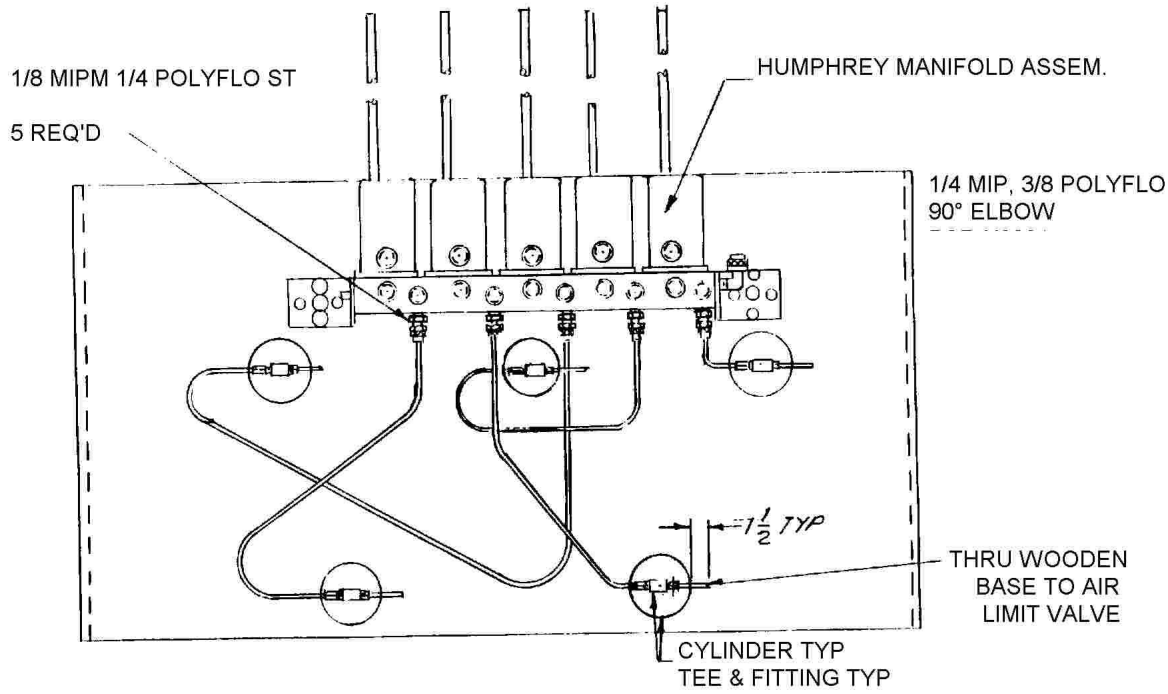


NEW STYLE WHAC-A-MOLE HOUSING ASSEMBLY
PLAN VIEW

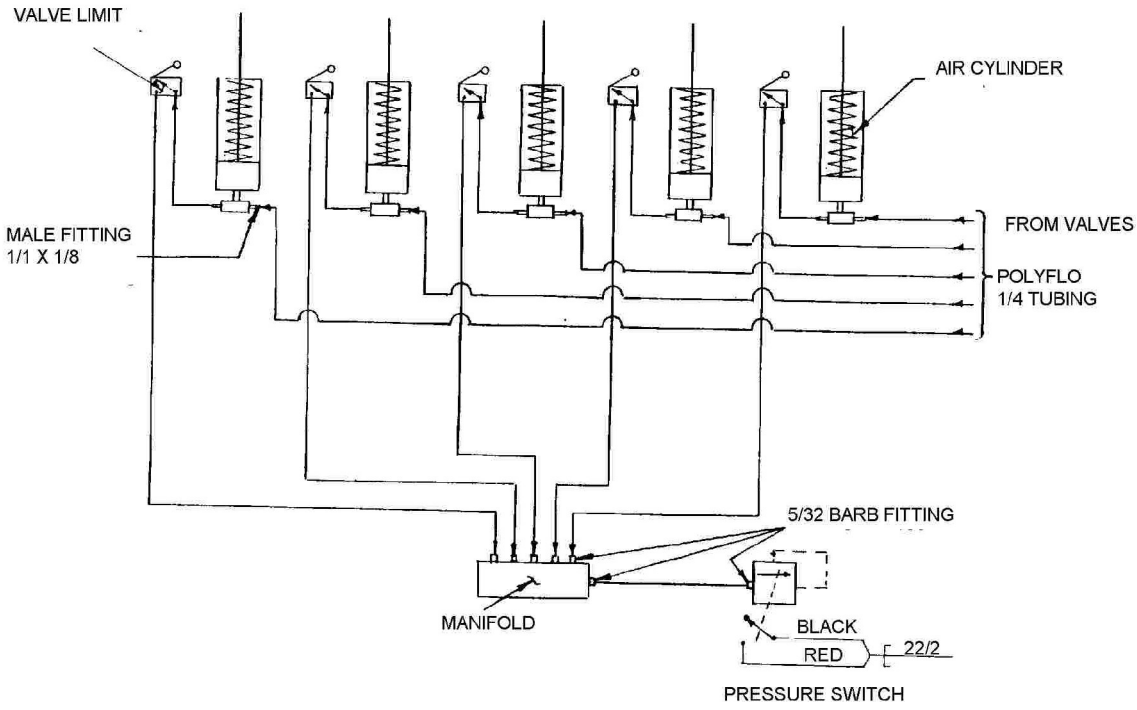


NOTE:
ALL TUBING 5/32

NEW STYLE WHAC-A-MOLE HOUISING ASSEMBLY BOTTOM VIEW

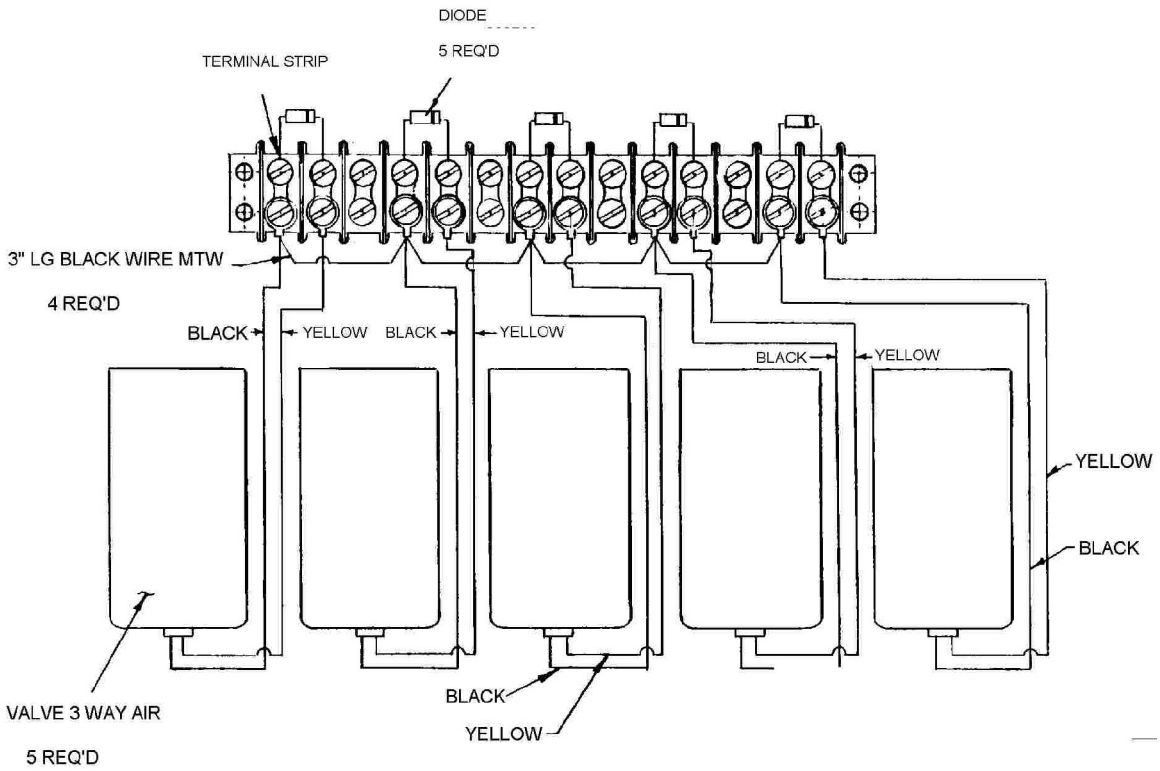


WHAC-A-MOLE PNEUMATIC SCHEMATIC



NOTE:
ALL TUBING 5/32 NYLON BSR N0002750
UNLESS OTHERWISE SPECIFIED

OLD STYLE WHAC-A-MOLE WIRING DIAGRAM



TROUBLESHOOTING: MOLE BOXES

PROBLEMS/CAUSES	SUGGESTED FIX
Wires on Score Switches Breaking	
No Strain Relief	Use terminals with strain relief and secure wire to side of switch.
Heads Do Not Remain Up Long Enough	
Bad Valve or Cylinder	Switch air hoses between a good and bad valve to determine if either the valve or cylinder is bad.
One Head Will Not Score	
Bad Switch or Kinked Air Line	Check for air out of head switch when it is depressed.
Game Scores On It's Own	
Shorted Wire or Bad Switch	Check for a short on the score wire or the terminal strip. If switch is bad, replace.
Pressure Set Too High	Adjust pressure to 20psi.
One Head Will Not Score	
Valve Stuck Open	Check for a short circuit in one of the valves that makes the heads pop up.
Only One Head Pops Up	
Bad Relay	Check relay board under the countertop – a relay may be stuck open.
Air Switches Breaking	
Screws That Hold Switch in Place Too Tight; No Rubber Gasket	Adjust switch so when mole head is down there is a little movement left in the switch. Make certain you use rubber gaskets.

TROUBLESHOOTING: MOLE BOXES

(CONTINUED)

PROBLEMS/CAUSES	SUGGESTED FIX
One head Will Not Come Up	
No Power On Terminal Block	Check voltage on terminal block. If none, then swap wires from bad solenoid with a good one. Could also be a bad trace on relay boards.
Power at Relay Board Okay, but Head Still Won't Come Up.	Bad valve or cylinder. Pull air line out of the cylinder to see if any are comes out of the line. If it has air, then it's a bad cylinder. If there is no air, then it's a bad valve.

MISCELLANEOUS

PARTS LIST

Part #	Description
Cx003000	Tabletop – planed & unplaned
E0003800	Relay, 12V DC, KHAU – 17D12
E0004300	Solid State Relay AC Rssd 10amp
E0013400	Switch, Micro, Whac-A-Mole 516 (before 1991)
E0013750	Bottom Microswitch WAC
E0013950	Switch, Pattie Cakes, White
E0013950-AMB	Switch, Pattie Cakes, Amber
E0013950-BL	Switch, Pattie Cakes, Blue
E0013950-GRN	Switch, Pattie Cakes, Green
E0013950-RED	Switch, Pattie Cakes, Red
E0013950-YEL	Switch, Pattie Cakes, Yellow
E0020200	Ticket Dispenser, PC Board
E0020300	Ticket Dispenser
E0024100	Fuse, 10Amp
E0022670	12V, 7.5Amp Power Supply (Requires E0022671, Power Supply Cover)
E0022710	12V, 15Amp Power Supply
E0025100	Meter, 12V DC Eaton-Durant
E0028800	Bulb, 10S11N Whac-A-Mole
E0029100	Bulb, 1195 for Beacon
E0029105	Bulb, Blue, Beacon 12V 27W 1A
E0029785-60	Rope Light WAC Insert, Short
E0029785-66	Rope Light WAC Insert, Long
E0030500	Beacon, 12V Amber
E0030630	Beacon, Blue, 12V Low Profile
H0001200	#14 Finish Washer, Whac Top
H0015050	¼" X 20 X 2" Tabletop Allen Screw
M0010530	CRC Spray
M0010500	Lubriplate Tube
M0010900	Screwlox, Driver #2
M0010910	T-handle Allen Wrench 5/32
MX010000	Mole With Shaft Assembly (Adult)
MX010100	Hammer, Whac-A-Mole Assembly
MX010150	Hammer, Kiddie Whac-A-Mole assembly
N0002350	Switch, Air-to-Electric
N0002360	Switch, Air Under head (after 1991)
N0002500	Valve, 3-Way Air WAM (Adult)
N0002650	Manifold, Kiddie, 3-head
N0002700	FRL, ½ Filter Regulator Lubricator
N0003200	Air Cylinder WAM 2 X 1 ¼
N0003400	Manifold (Adult)

APPENDIX

COIN MECHANISM

OVERVIEW

In all of our arcade games we use the Coin Mechanisms, Inc. brand of coin mechanism, unless the customer requests a different brand.

Mechanical Coin Mechanisms

When a player inserts a coin or token, it travels through a chute to the coin mechanism. The coin travels down onto a weighted lever that slows the coin and flips it over in front of a magnet. If the coin used is too light, it will get stuck on that weighted lever. If it is too heavy, the coin will be shot straight past the magnet and out the coin return slot. As the coin passes the magnet, the magnetic field slows the coin down enough to change its path and pass the coin by the coin switch. The coin mechanisms are replaceable and are available for a variety of coin sizes and tokens.

Coin Comparator (Electrical) Mechanisms

Also available is an electronic coin comparator that is used if you need high security, or have an unusual token or coin size. The coin comparator uses a good coin to compare to the coin being inserted. A coin must first pass the comparing circuit and register as a good coin, then travel past both optical sensors, in the correct direction, within a pre-determined time. If a coin is passed by the optical sensor backwards, as if on a string, the comparator will detect it and cause an "inhibit." The inhibit will cause a complete rejection of any coin, good or bad, for 16 seconds. After that time, the unit resets itself.

TICKET DISPENSER

TICKET DISPENSER

ELECTRONIC OPERATION

When the control unit calls for a ticket to be issued, 12V DC is applied to the ticket enable wire causing the motor to turn on. When a ticket is dispensed, the sensor senses a notch in a ticket and sends back a signal to the control unit. If no more tickets are called for, the enable voltage is turned off and the motor stops.

MECHANICAL OPERATION

The tickets are moved through the ticket chute by means of a power driven roller, which is spring loaded against an idler roller. The power driven roller has two Neoprene o-rings installed, and under normal operating conditions, are the only things in contact with the tickets.

The power driven roller is mounted on the output shaft of the motor gear train assembly. The motor assembly is mounted to the pivot bracket assembly in two Oilite bearings. The motor assembly has a limited free swing, limited by a single pin engaged in the brake sprag. The brake sprag engages the power assembly. The direction of torque, when electric power is applied is in a direction so as to release the brake sprag. When an attempt is made to pull tickets from the machine with the power off, the torque is reversed and the brake sprag is engaged. Also, the pulling of tickets will cause the pivot bracket assembly to apply a pressure to the power driven roller against the ticket and idler roller greater than the pre-set spring load. This causes the o-rings to depress and the coarse knurled surface of the roller will grip the tickets. One ounce of pull on the tickets will apply 20lbs of pressure on the rollers.

During 1992 Deltronic Labs made enhancements to their ticket dispensers. These included a push-to-feed ticket button on the main ticket dispenser board for ease of feeding tickets and the removable top on the ticket guide to allow ease of access to removing jammed tickets.

TROUBLESHOOTING – TICKET DISPENSER

PROBLEMS/CAUSES	SUGGESTED FIX
Dispenses Tickets Continuously (Not the same as Too Many Tickets)	
Bad driver IC	Replace the IC that has the ticket enable line – see the output definitions for your controller board.
Bad Darlington on ticket dispenser board	Put a jumper between the white wire and black wire on ticket dispenser plug. If motor stops, the problem is in the game. If the problem continues: it's a bad ticket dispenser board. (Replace the driver transistor or ticket dispenser board.)
Shorted pull-up resistor	Locate the pull-up resistor (1K ¼ W); make certain the leads are not shorted. Replace if necessary.
White and red wire shorted	Examine the wire terminations from the game to the ticket dispenser. The wire may have been closed in the ticket dispenser door causing a short.
Dispenses No Tickets	
No power to ticket board	Check the voltage between the red and black wires on the ticket dispenser Molex plug; it should be 12V DC.
Bad Darlington transistor(s)	Replace Darlington transistor(s) or ticket dispenser board.
Bad motor	Swap the ticket dispenser with another unit.
Wrong option setting(s)	Check the option setting(s) for this game (see information on your controller board).
Bad IC driver	Replace the IC that has the ticket enable line (see the output definitions for your controller board).

TROUBLESHOOTING – TICKET DISPENSER

(CONTINUED)

PROBLEMS/CAUSES	SUGGESTED FIX
Dispenses No Tickets (CONTINUED) Bad ticket dispenser	When tickets are to be dispensed, check between the white (enable) wire and the black wire; should be 12V DC. If voltage is okay, ticket dispenser may be bad.
Doesn't Dispense Enough Tickets (OR) Dispenses Too Many Tickets Wrong option settings(s)	Check the options setting(s) for this game (see information on your controller board).
Ticket guide spring missing/needs adjustment	Read the ticket dispenser manual under "Ticket Guide Spring".
Bad/dirty optic sensor	Blow paper dust out of the optic sensor. If that doesn't solve the problem then swap ticket board with another unit.
Bad ticket count input on controller board	Check ticket count LED on your controller board (see info on the controller board).
Bad ticket notch output transistor on the ticket dispenser board	Swap board with another unit to verify this, then replace the bad board or ticket notch output transistor (see Ticket Dispenser Manual). The blue wire goes to ground when no tickets are under the sensor eye.
Bad board	Check connections between front panel board and ticket dispenser.
Bad front panel board	Check voltage between the green wire (ticket sensor) and the black wires: should be pulsing 12V DC for each ticket. If that is okay, then the front panel board may be bad.

REDEMPTION

REDEMPTION

INTRODUCTION

This explanation of redemption procedures is not meant to be an all inclusive document or a 'cast-in-stone' rule book. It is designed to outline basic concepts of what redemption is, how it works, and why it is both popular and profitable. For further discussion on planning, design, game selection, and operation of Redemption Centers, please contact our sales office.

WHAT IS REDEMPTION?

The concept of redemption is to give players an incentive to play the game other than just for the entertainment value. The way this is usually done is to give some type of reward based on the player's score or performance.

Redemption games are any games in which a player has an opportunity to win tickets, tokens, prizes, bubble gum cards, baseball cards, or any other type of award for playing the game. Usually the amount of the prize is based upon the performance of the player - it may be based on how many players the person beats in a game, or how many points are scored.

WHAT IS A PERCENTAGE?

A percentage is how many cents, on average, you are giving back for every dollar taken in. (When you see the % from here on it means cents on the dollar awarded.)

FIXED PAYOUT

Standard Bob's Space Racers® games give tickets as the reward. You will need to determine what percentage you want to use. The most successful percentage of payout is thirty percent (30%).

WHY DOES REDEMPTION WORK?

One reason that redemption works is because Family Fun Centers are becoming more popular and families can spend quality time together. The video game industry was pretty much reliant upon teenagers as their main clientele. With the advent of the Family Fun Center, video games are still there for the teenagers, although they have lost some of their popularity (possibly due to the home game industry). Redemption games are usually targeted for general audiences. With the addition of "kiddie" models that target now extends to the whole family. Redemption is popular in this family group due to the fact that the parents are usually paying for the entertainment and, generally, they like to see that they are getting something for their money.

REDEMPTION

(CONTINUED)

WHY DOES REDEMPTION WORK? (CONTINUED)

With a payout of tickets, parents are more willing to let their children play the various games when the kids are going to actually receive some type of reward for what they have done.

For example: If a younger child has a small prize (i.e. a novelty pencil eraser) they would like to win, the parents will probably allow him/her to continue to play the game until they have won enough tickets to exchange for that prize. Whereas older children, such as teenagers, may want to save up their tickets to redeem them for a larger prize (i.e. a portable radio) that will encourage them to visit the establishment more frequently.

It is important to note that the most successful redemption operations do have some video games. They are a good means of entertainment, but the redemption allows a draw from a larger variety of patrons for your market. Also, because redemption games are played for the ticket payout as much as they are for the entertainment value, they typically do well as the years go by versus the video game only lasting for several months before a significant drop-off in game play is experienced.

MERCHANDISING

Redemption is yet another method of selling merchandise. Your customer is the family that comes into your Fun Center. Your merchandise selection should include items of interest to all age groups. It is very difficult to entice people to play the games if there is no merchandise they wish to win. A well stocked, properly displayed, and brightly-lit redemption counter is essential. Your pricing should also be competitive. Your customers are aware of retail pricing on most items you will have in stock; if they see items marked at exorbitant prices, they will not play our games.

A good rule of thumb is to mark your merchandise up only ten percent (10%). Thus, an item you bought for $1.00 should sell for $1.10 (110 tickets). You have already made a fair profit on the play of the game, so mark the merchandise up enough to handle freight (shipping) and handling – which in most instances is ten percent (10%) of the cost you pay for the merchandise. It might seem as though you are losing an opportunity to increase your profits, however the word-of-mouth comments on your operation will pay off much more in the long run.

BSR MEDIUM AIR COMPRESSOR

BOB'S SPACE RACERS® MEDIUM AIR COMPRESSOR

IMPORTANT NOTICE

Read carefully before attempting to assemble, install, operate, or maintain the BSR Air Compressor. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage!

When unpacking the unit, inspect carefully for any damage that may have occurred during transit. Make certain any loose fittings, bolts, et cetera, are tightened prior to putting unit into service.

BSR MEDIUM AIR COMPRESSOR
GENERAL INFORMATION

The BSR Medium Air Compressor is a basic, but very important, piece of equipment. Be certain to understand this information before any adjustments are made on this machine.

After the BSR Medium Air Compressor is plugged into the electrical outlet it will run continuously until the air pressure inside the holding tank reaches the preset pressure. When the pressure switch notes the proper air pressure inside the holding tank, it will automatically turn off the motor.

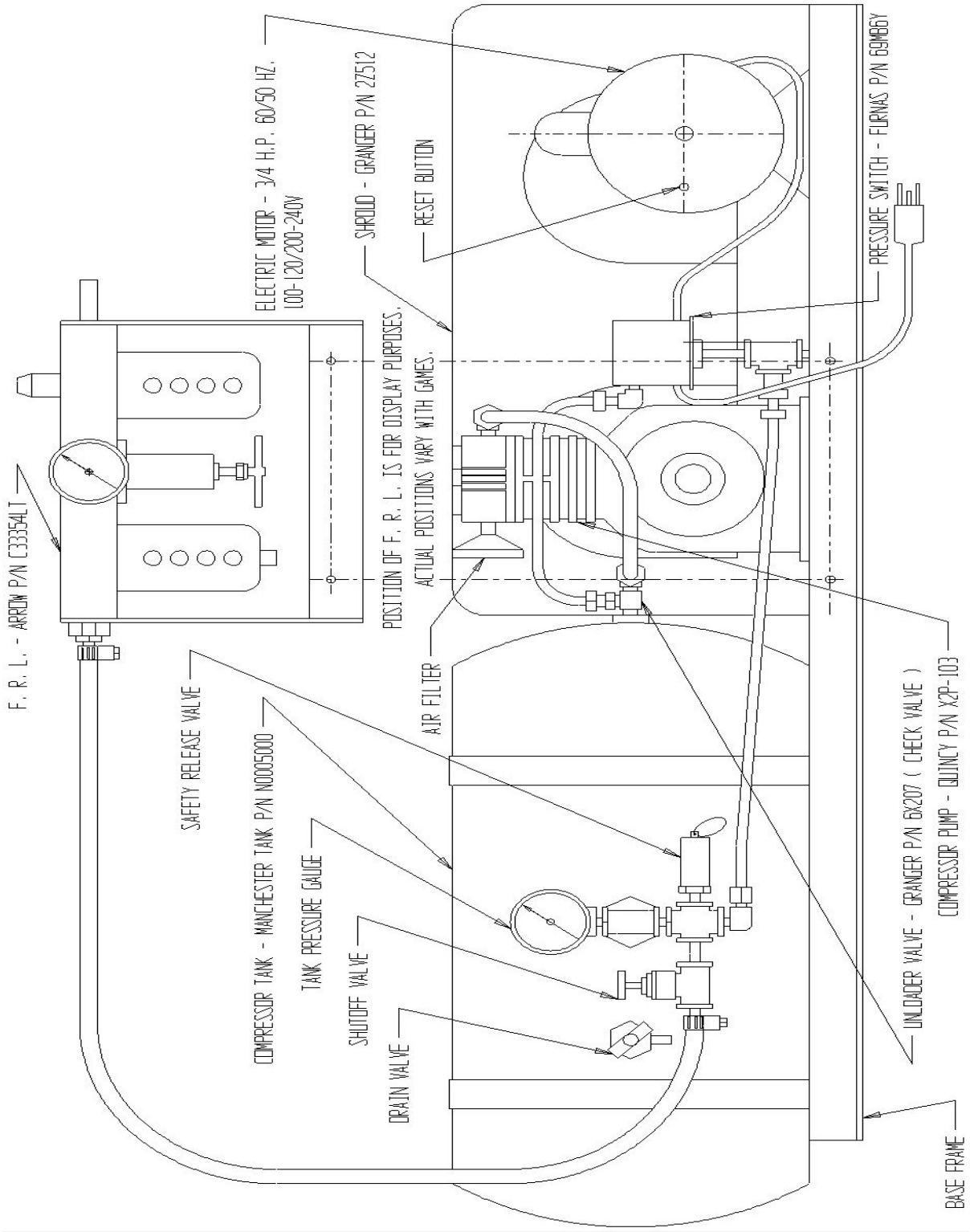
When the motor turns off, the excess pressurized air that is trapped between the compressor head and the check valve needs to be released. This is done automatically, when the pressure switch shuts off, via the needle valve, which is bolted to the side of it. The needle valve is pushed open by a small lever mounted on the side of the pressure switch. The holding tank shouldn't empty through the needle valve. The check valve prevents this from happening when the needle valve is open; it allows air to go into, but not out of the holding tank. The needle valve lets air out of the compressor head so that when the motor turns back on, there will not be any pressure on the compressor head. This prevents the motor from spinning around. When the motor starts up again then the small lever comes off of the needle valve, thus allowing pressure to develop in the compressor head again. This pressure will go through the check valve and into the holding tank.

On the side of the holding tank is a pipefitting. On this fitting is a pressure gauge, safety valve, and drain valve. The pressure gauge shows you how much pressure is inside the holding tank. The safety valve has a small metal ring on it. If the pressure gauge shows too much pressure inside the holding tank, then you will need to pull the metal ring on the safety valve to release the air. **Caution! An excess amount of pressure in the holding tank can cause an explosion! NEVER REPLACE THE SAFETY VALVE WITH A PLUG!** The drain valve is for draining the holding tank and removing water from it. Water develops in the tank due to condensation. For your compressor to function properly, the holding tank needs to be drained on a weekly basis.

There is a pushbutton on the back of the compressor motor. This button resets the motor should it overheat. Newer models don't have a reset button; they have auto-reset when the temperature of the motor cools down to the appropriate level.

The air then goes from the compressor (or house supply) to the Filter, Regulator, Lubricator (F.R.L.) and manifold assembly. The filter collects any water that is in the air and deposits it in the first glass bowl. This should be drained routinely by means of the petcock on the bottom of the bowl. The regulator then allows only a preset amount of air pressure into the manifold. The lubricator automatically puts oil into the air to keep all valves and cylinders in good working condition. The lubricator bowl should always be kept full with 10w non-detergent oil.

BSR AIR COMPRESSOR – DIAGRAM



GROUNDING INSTRUCTIONS

1. The BSR Air Compressor should always be grounded. In the event of an electrical short circuit, grounding reduces the risk of electrical shock by providing an escape route for the electric current. This air compressor is equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. **NOTE: Do not use a rounding adapter.**

* DANGER *

INPROPER USE OF GROUNDING PLUG CAN RESULT IN ELECTRICAL SHOCK!

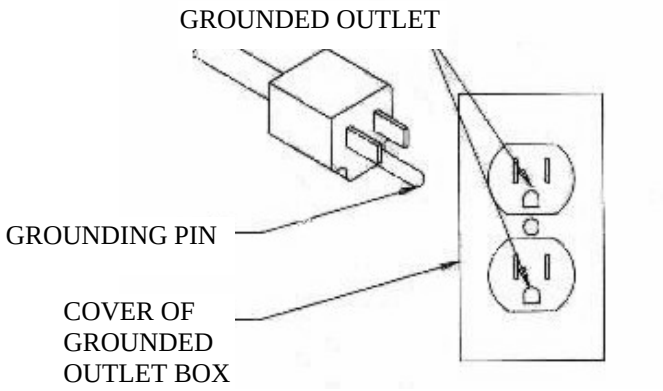
2. If repair or replacement of cord or plug is necessary, do not connect grounding wire to either flat blade terminal. The wire with insulation, having an outlet surface that is green, with or without yellow stripes, is the grounding wire.

3. Check with a qualified electrician or serviceperson if grounding instructions are not completely understood, or if you are in doubt about product being properly grounded. Do not modify plug provided; if it will not fit your outlet, have the proper outlet installed by a qualified electrician.

* WARNING *

NEVER CONNECT THE GREEN (OR GREEN AND YELLOW) WIRE TO A LIVE TERMINAL!

GROUNDING METHOD



BSR MEDIUM AIR COMPRESSOR SAFETY INFORMATION

* WARNING *

ALL ELECTRICAL WORK SHOULD BE DONE BY A LICENSED, OR CERTIFIED, ELECTRICIAN. ON A PROPERLY WIRED CIRCUIT, THE BLACK WIRES CARRY THE ELECTRICAL CURRENT.

1. Carefully read the instruction manual for each component prior to attempting to assemble, disassemble, or operate your system.

2. Do not exceed the pressure rating of any component in this system.

3. Protect material lines and air lines from damage or puncture. Keep hose and power cable away from sharp objects, chemicals, oil, and other solvent spills, and wet floors.

4. Never point a spray gun at yourself, or anyone else. Accidental discharge may result in serious injury.

5. Check hoses for weak or worn areas before each use; make certain all connections are secure; do not use is deficiency is found.

6. Release all pressures within system slowly; dust and debris expelled at high speeds may be harmful.

* WARNING *

DISCONNECT POWER AND DEPRESSURIZE SYSTEM BEFORE SERVICING AIR COMPRESSOR! (TURN PRESSURE REGULATOR KNOB FULLY CLOCKWISE AFTER SHUTTING OFF COMPRESSOR.)

7. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

8. Wiring and fuses should follow electrical codes, current capacity, and be properly grounded.

9. Electrical motors must be securely and adequately grounded.
(See Grounding Instructions in this manual.)

BSR MEDIUM AIR COMPRESSOR SAFETY INFORMATION

(CONTINUED)

10. Always disconnect power source (or its connected load) prior to working on, or near, a motor.

11. Guard all moving parts; keep visitors away. Never allow children in work areas.

12. Use only a properly grounded outlet that will accept a three (3) pronged plug, and wear shoes to prevent shock hazards.

13. Be careful when touching exterior, or operating motor; it may be hot enough to cause injury.

14. Protect power cables from coming in contact with sharp objects.

15. Clean electrical/electronic equipment with an approved cleaning agent (such as a dry, non-flammable cleaning solvent).

16. To avoid spontaneous combustion, discard waste rags into approved metal waste cans.

17. Never store flammable liquids , or gasses, in the vicinity of the BSR Air Compressor.

18. When spraying with solvent of toxic chemicals, follow the instructions provided by the chemical's manufacturer.

19. NEVER reset the safety valve or pressure switch. Keep the safety valve free from paint and other accumulations. (This provides safety against over-pressure.)

20. Do regular maintenance; keep all nuts, bolts, and screws tight; be certain equipment is in safe working condition.

BSR MEDIUM AIR COMPRESSOR MAINTENANCE

Daily

1. Check oil
   - Air Compressor: 30w non-detergent
   - Lubricator (if supplied): 10w non-detergent
2. Check dryer and drain, if necessary.

Weekly

1. Drain air tank.
2. Clean cooling surfaces of BSR Air Compressor.

Monthly

1. Operate safety valves on compressor or tank.
2. Replace or clean air filter.
3. Check belt tension on compressor.
4. Check pulley clamp bolt and set screws.
5. Inspect air lines, rubber, and PVC.

Semi-Annually (Twice Each Year)

1. Inspect valve assemblies.
2. Check pressure hoses from compressor to tank.
3. Check discharge line for carbon build-up.
4. Check contact points in pressure switch.

BSR AIR COMPRESSOR WIRING

1. Local electrical wiring codes differ in each area. The source wiring, plug, and protector must be rated for the amperage and voltage indicated on the motor nameplate. They must, also, meet all electrical codes for your area and meet the minimum indicated on the motor nameplate.

2. Use a Type "T" fuse (slow-blow), or a circuit breaker.

   CAUTION: Overheating, short circuits, and fire damage will result from inadequate wiring, et cetera.

   Note: 115V 15amp units can be operated on a 115V 15amp circuit under the conditions:

   i. No other electrical appliances, or lights, are connected to the same branch circuit.
   ii. Voltage supply is normal.
   iii. Extension cords are of the minimum gauge specified in this instruction manual.
   iv. The circuit is equipped with a 15amp circuit breaker or a 15amp slow-blow fuse.

3. If the above conditions cannot be met, or if nuisance tripping of current protection device occurs, it may be necessary to operate the BSR Air Compressor from a 115V 20amp circuit.

TROUBLESHOOTING – BSR AIR COMPRESSORS

PROBLEMS/CAUSES	SUGGESTED FIX
Air Leaking	
Loose fittings	Check fittings for leaks. If leaks are at fittings: drain tank; disconnect fitting; and reconnect it properly.
Needle valve (while running)	Check needle valve for leak. If needle valve is leaking while game is running: unplug the Air Compressor, remove needle valve using a wrench; clean out needle valve (with hot, soapy water); spray a light oil lubricant into the needle valve (such as WD-40); install needle valve. If problem continues, replace with new needle valve.
Needle valve (while shut off) (AKA: check valve)	If needle valve is leaking when the compressor shuts off, the problem is the check valve, not the needle valve. Unplug the compressor and drain the tank; remove check valve using a wrench; carefully take apart the check valve and clean (with hot, soapy water); spray a light oil lubricant on parts (WD-40); reassemble valve; install check valve. If problem continues, replace with new check valve.
Compressor Runs Continuously	
Pressure switch	If the BSR Air Compressor runs continuously, and there is not a constant leak, then you need to adjust the pressure switch. If the problem continues, replace with a new pressure switch.
No Air Pressure	
Line kinked; compressor not on	Check air line for kinks; check power.

TROUBLESHOOTING – BSR AIR COMPRESSORS

(CONTINUED)

PROBLEMS/CAUSES	SUGGESTED FIX
Compressor Won't Start	
Pressure switch	See Compressor Runs Continuously on previous page.
Circuit breaker	Check the breaker box (fuse box) or individual fuse for a blown breaker/fuse. Correct the problem.
Thermal breaker on air compressor	This is a push button switch on the back of the electric motor that turns on the air compressor. Simply push in the button to reset the motor. (Some motors are painted and have the switch painted as well.) In order to push in this button, if it is painted over, use the butt side of a screwdriver handle and rap the button fairly hard to get it to reset.
Needle valve	If the needle valve doesn't remove the back air pressure properly, then the motor won't be able to turn over the compressor, and this may cause smoke! If the needle valve is the problem, then treat it the same as if the problem was an air leakage and the cause was the Needle Valve (While Running). See previous page for instructions.

SOUND SYSTEMS

ARCADE SOUND BOARD – CLEVER DEVICES

OVERVIEW

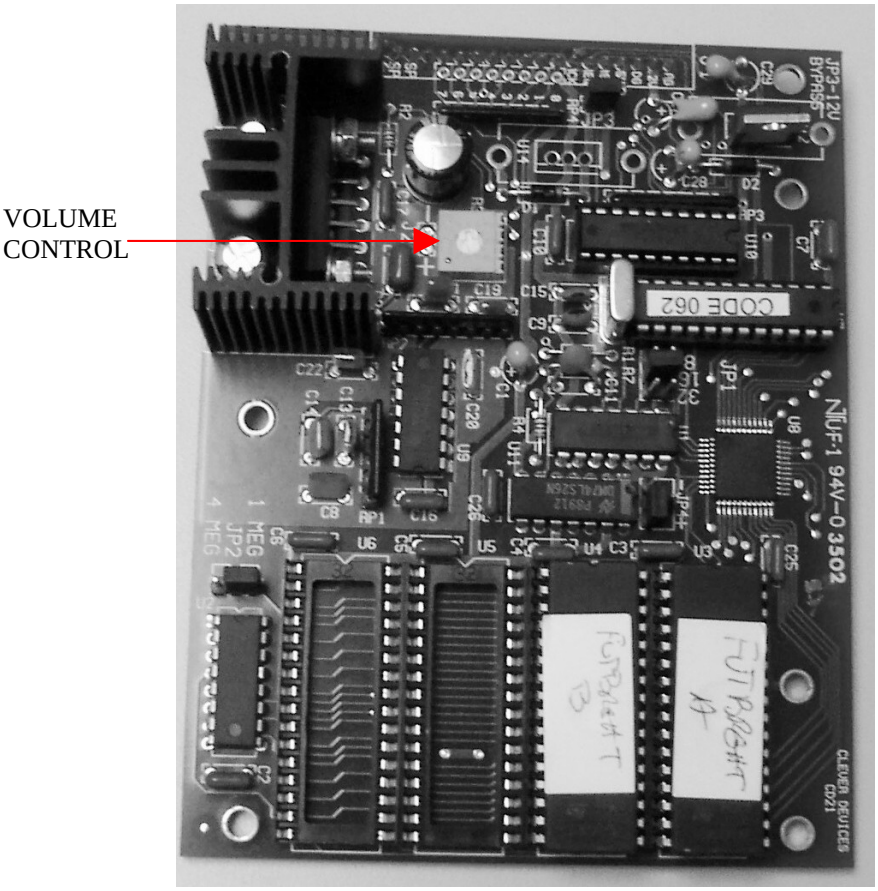
The Clever Device board has been the most commonly used arcade sound board. It is very important not to allow this board to get wet. Bob's Space Racers® does not Advance Replace this board unless it has a direct affect on the game play. The sound board piggy-backs on top of the 2300 or 2400 controller boards.

For example: A Monkey Drop™ Arcade Game cannot be played without the use of it's sounds or play instructions.

A Whac-A-Mole® Arcade Game can obviously be successfully played without sound. Therefore, you will be required to send in your sound board for repair.

VOLUME CONTROL

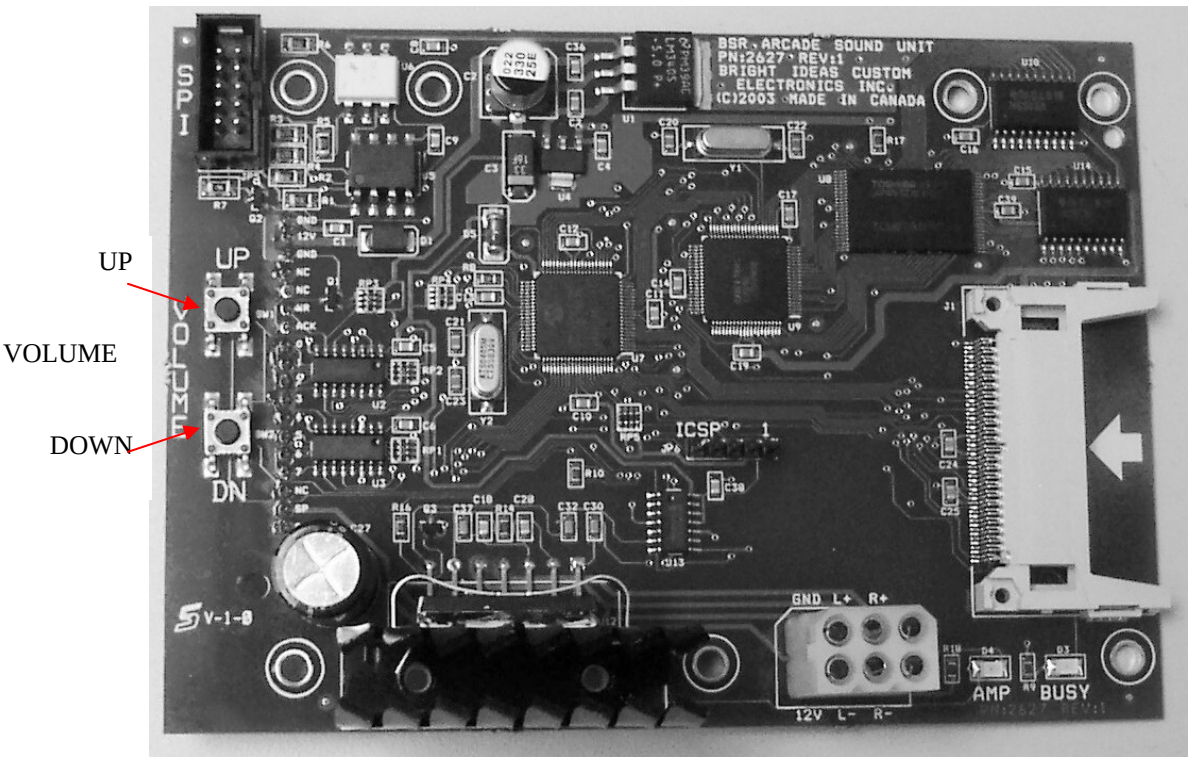
The Clever Device board has a small potentiometer for volume control. It requires a small screwdriver to adjust the volume. The music is stored in two (2) program chips and must be addressed correctly.



ARCADE SOUND BOARD – BRIGHT IDEAS

OVERVIEW

A newer generation of our arcade sound boards is the Bright Ideas board. It piggy-backs on top of the 2300 or 2400 controller board. The music is stored to a microprocessor by use of a digital sound card. These sound boards are not Advanced Replaced unless they have a direct affect on the play or performance of the game.

VOLUME CONTROL

The volume control can be easily adjusted by use of two (2) buttons, “Up” and “Down”. These buttons are clearly labeled and visible on the sound board.