★ SPECIAL FORCE

Operating Manual

Bally MIDWAY MFG. CO.

Bally/**MIDWAY**
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Printed in U.S.A.

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BLOCK DIAGRAM—ELECTRONIC PINBALL GAME
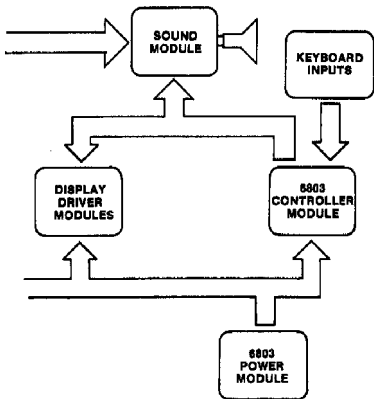
DETACHING OF PIN-GAME BACK BOX

When the back box is in an up-right positon and the 3/8" hold-down bolts are removed, the back box can be removed from the main cabinet by lifting the right corner of the back box (about 3/4") and pulling it slightly towards you. Now both hinges are disengaged and the back box can be removed.

"IMPORTANT NOTICE"

ALL 3 PLAYFIELD BALLS MUST BE INSERTED
IN THE OUTHOLE TROUGH.

GAME WILL NOT START IF THERE IS A
BALL IN SHOOTER LANE IN GAME OVER
MODE.

M051-00A40-A016

SECTION 1

I. INSTALLATION

First, bolt legs to cabinet. Second, feed line cord between back box and cabinet then lift the back box and secure with bolts. Insert the smaller ball (15/16" dia.) into the ball tilt assembly, and adjust the bracket so the ball will roll free to the contact switch blade, if the front of the cabinet is raised.

On all games these are certain items that should be checked after shipment.

1. Check that all cable connectors are completely seated on printed circuit assemblies.
2. Check that all cables are clear of moving parts.
3. Check for wires that may have been disconnected.
4. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
5. Check coils for proper soldering. Cold solder connections may not show up in factory inspection, but vibration in shipment may break contact.
6. Check that fuses are firmly seated and making good contact.
7. Check and adjust the plumb bob tilt on the left side of the cabinet.
8. Check wiring of the plug on the transformer to correspond to location voltage.

   115 VAC 2-8, 3-6, 7-10
   120 VAC 2-6, 4-6, 7-11
   220 VAC 4-8, 7-9
   240 VAC 4-8, 7-11

9. Place ball into playfield by outhole (or balls if the game requires more than one ball).
10. Plug in line cord.

II. GENERAL GAME OPERATION

Move the ON/OFF switch at the bottom right front corner of the cabinet to "ON" position. The game will play a power-up sequence and reset the drop targets. If any switches are stuck they will be displayed at this time. After a short delay "1-4 can play" will indicate that the game is ready to play. The game should accept the coin and post the appropriate credits. Pressing the credit button on the cabinet will cause the outhole kicker to serve the ball to the shooter alley. A game-up sequence is played to announce play-readiness.

Each time the credit button is pressed it posts one player and the credits are reduced by one.

Shooting the ball initiates play.

The game awards all points earned by the player. If a spinner is turned and scoring when the ball hits a target, the spinner and the target scores are awarded.

When the ball enters the outhole, the bonus score is added to the total score. The player-up and/or ball in play is advanced one position. The outhole kicker serves the ball to the shooter alley and play is resumed. This continues until each player has played the allowable number of balls per game. At this time a random Match number appears. If the number is the same as the last two digits in a player's score, a free game is awarded.

Extra balls won during the course of the game are played immediately after the player's regular ball enters the outhole. The player-up and/or ball in play are not advanced for extra score before the game serves the extra ball for play.

Slamming the machine results in loss of the game. This causes all feature lights to go out, the game goes "dead" and a time delay occurs. This occurs anytime either one of the slam switches make contact. This is to discourage unnecessary abuse to the game. After the delay, "1 to 4 can play" is displayed followed by the power-up sound sequence.

Any number of slam switches could be installed by the operator, to meet his individual requirement. The switch should be adjusted to have approximately 1/16" gap between the contacts. The weighted blade should be adjusted to attain the desired sensitivity. Decreasing the gap between contacts will make the switch more sensitive. Opening the gap will reduce sensitivity.

If at the end of the game either the "High Score to Date" is beaten or if the score is over 10,000,000 free games will be awarded according to the "High Score to Date" register setting.

Tilting the game results in loss of a ball. Bonus points are not scored. The flippers, thumper bumpers, etc. go 'dead'. The purpose of the tilt penalty is to discourage the player from jostling the machine in an attempt to prolong play. Game action becomes normal when the ball kicker serves the ball to the shooter alley.

NOTE: These are general instructions. Therefore, if a spinner or Drop Target is not used on your specific pinball game, please disregard any operating instructions related to these devices.

III. TAILORING & TESTING THE GAME

INTRODUCTION

We at Bally/Midway are very proud to introduce our new system which not only provides more information to the operator but it also communicates with the player thru the use of alphanumerics.

It was our aim to design a system which could be used without a manual. This will come to light the moment you press the Self-test button and the displays come to life with their messages of assistance. This allows you to change game features, awards and threshold settings and monitor specific special awards, game percent and income just by reading what is displayed. The registers are now described with useful titles such as "Book-keeping Data" or "Self-Testing."

If you've ever changed the replay thresholds on a machine and you forgot to change the replay card because you were distracted by a customer, listen to this: "It will never happen again!" For when you change this replay threshold to 2,000,000 in "Percent Options" the corresponding message: "First Replay at 2,000,000" will be displayed on Game Over.

OPERATION

The keyboard is located on the right inside wall of the game near the front door. The cable is long enough, so that once the keyboard is removed, it may be operated from outside the machine. The keypad is mounted with a 1/4" Hex screw for shipping purposes.

1. Press the Test button located on the front door. This tells the processor to do the following:
   A. It checks the switches wired in parallel with the keypad. If any switches are closed the game automatically jumps to Stuck Switch Test and displays a stuck switch message.
   B. If there were no stuck switches you will be welcomed with "Bally's Testing is Easy As ABC."
2. When appropriate heading appears on backglass display, press "Enter" on keypad once.
   Within each heading, there are categories which are operator selectable. When the appropriate category appears on the backglass display, press "Enter" once to access that category.
3. Set your registers with keypad.
4. Press "Enter" again to advance to next category setting. Press "CLR" to re-start Self-Test. Press "Game" to lock-in option settings.

STEPPING THROUGH

To choose a category quickly once the Test Mode has been selected just use the "A" button to step to the desired category. If you pass by the category you desired, use the "B" button to back-up to the appropriate position. Once you read the category desired, press the "ENTER" button to select that topic. The display will now show the first item in that category.

Again, use the "A" and "B" buttons to quickly step to the item you wish to look at or change. The "A" button allows you to step to the end of a category and then out to the next category. The "B" button allows you to step backwards in the same manner. Please note: When in the Self-Test category, the display will cycle automatically from one test to the next. Because the "A", "B", and "C" buttons are used for different functions in this category. They cannot be used to step from one test to another properly. To exit a test in this category just press the ENTER button & step to the next test.

SELF-PERCENTAGING

1. The term Self-Percentaging refers to the game's ability to automatically adjust the score level of Threshold 1 to attain a desired replay percentage, also known as the TARGET PERCENT. (see article #8)

2. Self-Percentaging also applies to extra balls, when used instead of replays.

3. Initially, a minimum of 200 games must be played before the Self-Percentaging Process goes into effect. It then monitors the current replay percentage of Threshold 1 ONLY and makes an adjustment, if necessary, every 50 games.

4. The Self-Percentaging Process will automatically adjust the score level of Threshold 1 **ONLY**. It makes NO adjustments to OTHER "Award" features in the game.

5. Located within the "PERCENT OPTIONS" category of your game's test mode are the following registers:
   - **THRESHOLD 1**
   - **SELF PERCENT**
   - **TARGET PERCENT**
   - **THRESHOLD 1 PERCENT**

   Each of these registers are explained in detail further in this text.

6. To set or check the current score level of Threshold 1:
   A. "Step through" your game's test mode, using the "A" or "B" button on the keypad, until you reach a category titled: "PERCENT OPTIONS."
   B. Press the "ENTER" button to select this category.
   C. The first register displayed will be THRESHOLD 1.

   THRESHOLD 1—This register displays the current score level of the 1st Replay Threshold. Enter any value from 0 to 9,999,999 to set the desired score level.

7. To activate the Self-Percentaging Process:
   A. "Step through" your game's test mode, using the "A" or "B" button on the keypad, until you reach a category titled "PERCENT OPTIONS."
   B. Press the "ENTER" button to select this category.
   C. Again, use the "A" button to "step through" until you reach a register titled: "SELF PERCENT."

   SELF PERCENT—This register displays whether the Self-Percentaging Process is OFF or ON. Enter "0" to turn OFF or "1" to turn ON.

8. To adjust the desired Replay Percentage for Threshold 1:
   A. "Step through" your game's test mode, using the "A" or "B" button on the keypad, until you reach a category titled "PERCENT OPTIONS."
   B. Press the "ENTER" button to select this category.
   C. Again, use the "A" button to "step through" until you reach a register titled: "TARGET PERCENT."

   TARGET PERCENT—This register displays the desired percentage of replays to be awarded for reaching Threshold 1. For example, if you want Threshold 1 to award a replay in 15% of the games played, you would press keys "1," "5" and then "ENTER." This register will then display "15%" as your goal or "TARGET PERCENT."
   NOTE: This register automatically defaults to a factory setting of "10%," when the "FACTORY RESET" register is enabled.

9. The TOTAL Replay Percentage will be 10% or 15% higher with the addition of Match, Special and High Score to Date credits.

10. To manually check the <u>current</u> replay percentage of Threshold 1 ONLY:

   A. "Step through" your game's test mode, using the "A" or "B" button on the keypad, until you reach a category titled "PERCENT OPTIONS."

   B. Press the "ENTER" button to select this category.

   C. Again, use the "A" button to "step through" until you reach a register titled: "THRESHOLD 1 PERCENT."

   THRESHOLD 1 PERCENT—The figure displayed in this register is the <u>actual</u> percentage of replays awarded for reaching Threshold 1. Progress of the Self-Percentaging Process may be monitored by comparing the current value displayed in this register with the "TARGET PERCENT."

11. The size of adjustment, made by the Self-Percentaging Process to the score level of Threshold 1, is determined by the current difference between the "TARGET PERCENT" (entered by the operator) and the <u>actual</u> percentage of replays awarded for reaching Threshold 1.

   • A difference of 10% or more will result in a 10% adjustment.

   • A difference equal to or greater than 5%, but less than 10%, will result in a 5% adjustment.

   • A difference less than 5% will result in a 1% adjustment.

12. To check the current score level of Threshold 1, refer to article #6.

13. When the "CLEAR BOOKKEEPING" register is enabled, the Self-Percentaging Process is reinitiated.

IV. GAME REGISTERS & OPTIONS

BOOKKEEPING DATA

Total Coins	Number of coins thru chutes 1, 2, & 3
Game Percent	Percentage of replays
Coins Chute 1	# of coins thru chute 1
Coins Chute 2	# of coins thru chute 2
Coins Chute 3	# of coins thru chute 3
Bonus Credits	Number of Bonus Credits Given
Total Plays	Number of plays both paid and replays
Total Replays	Number of awarded games
Service Meter	Total # of service credits
Game Credits	Current game credits—Enter 0 thru 5. Added to Service Meter. Not added to current Game Credits.
Special Meter	Total # of Playfield Specials awarded
Clear Booking	To clear bookkeeping press "85" then "Enter"

SELF-TESTING

Single Lamp	Steps one lamp at a time, and Connector I.D. Press "A" to advance, "B" to back up, and "C" to cycle
All Lamps	All lamps light alternately, 1st "A" phase then "B"
Display	Steps thru alphanumeric character set
Solenoid	Fires one driver at a time, and Displays Driver and Connector I.D.
Single Solenoid	Fires one driver at a time. Press A for same solenoid, B for next.
Sound	Plays game sounds
Game Rom I.D.	Displays your Rom or Roms I.D.
Switch Test	Displays stuck switch by description. PRESS TEST BUTTON ON DOOR TO EXIT SWITCH TEST

PERCENT DATA VALUES

Game Percent	Percentage of replays
Total Plays	Number of play both paid and replays
Game Time	Total number of minutes
Total Replays	Total number of replays
Threshold 1	# of times the first threshold was beaten
Threshold 2	# of times the second threshold was beaten
Threshold 3	# of times the third threshold was beaten
HiScore Beaten	Total number of times the high score was beaten
Free Balls	# of extra balls that were awarded
Specials	# of Specials awarded by completing each Outlane
Bombs Earned	# of Bombs earned
Rockets Earned	# of Rockets earned
Road Ramp	# of times the Road Ramp was completed
Weapon Ramp	# of times the Weapon Ramp was completed
Chopper Ramp	# of times the Chopper Ramp was completed
In-Line Targets Earned	# of In-line targets earned
2 Balls in Play	# of times 2-Ball game.
3 Balls in Play	# of times 3-Ball game.

PERCENT OPTIONS

		FACTORY SETTING
Threshold 1	Enter 0 thru 9,999,999; sets award level and display	1,000,000
Self Percent	Enter 0 or 1; 0 disables Self-Percentaging Process, 1 enables Self-Percentaging Process	1
Target Percent	Enter desired percentage of replays awarded for reaching Threshold 1.	10
Threshold 1 Percent	Displays actual percentage of replays awarded reaching Threshold 1.	Unchanged
Threshold 2	Enter 0 thru 9,999,999; sets award level and display	2,500,000
Threshold 3	Enter 0 thru 9,999,999; sets award level and display	00
Highest Score	Enter 0 thru 9,999,999; sets the HiScore replay level	3,000,000

BASIC OPTION VALUES

Credit Limit	Enter 1 thru 40	10
Balls per Game	Enter 1 thru 5	3
Threshold Mode	Enter 0 thru 3; 0=0, 1=Points, 2=Extra Ball, 3=Replay	3
Special Mode	Enter 0 thru 3; 0=1, 1=Points, 2=Extra Ball, 3=Replay	3
HiScore Mode	Enter 0 thru 3; 0=0, 1=1 Replay, 2=2 Replays, 3=3 Replays	3
Sound Mode	Enter 0 thru 3; 0=Chimes w/o background, 2=Sounds w/o background 1=Chimes with background, 3=Sounds with background	3
German Prize	German Meter	0
Match Option	Enter 0 or 1; 0 disables match, 1 enables match	1
Credit Display	Enter 0 or 1; 0=No credits displayed, 1=Displayed credits	1
No Limit Replays	Enter 0 or 1; 0=Only 1 award per game, 1=More than 1 per game	1
Free Play	Enter 0 or 65; 0=Coins, 65=Free Play	0
Slingshot	Enter 0 or 1; 0=No slingshots, 1=slingshots	1
Tilt Warning	Enter 0 thru 3; 0=No warning, 1=1, 2=2, 3=3	3

FEATURE OPTIONS

Reset Factory		Enter 65 for factory selected scores and features
Recall R-O-C-K-E-T	Enter 0 or 1;	0=No Memory 1=Memory
Recall B-O-M-B	Enter 0 or 1;	0=No Memory 1=Memory
Recall Road Values	Enter 0 or 1;	This entry recalls Road Value lights: 10K, 20K, 40K, and also recalls both Outlane Special lights 0=No Memory 1=Memory
Recall Bonus	Enter 0 or 1;	This entry recalls Bonus lights: 1K, 2K, 4K, 8K, 16K & 32K 0=No Memory 1=Memory
Recall Multiplier	Enter 0 or 1;	This entry recalls Bonus Multiplier lights: 2x, 3x, 4x, & 5K. 0=No Memory 1=Memory

Extra Ball   Enter 0 thru 7;   This entry controls number of times on Weapons Ramp required to activate Lite X-Ball light in Left Lane.

ENTER	WEAPONS RAMP	WEAPONS BONUS VALUE
0	8 times	20,000 points
1	7 times	175,000 points
2	6 times	150,000 points
3	5 times	125,000 points
4	4 times	100,000 points
5	3 times	75,000 points
6	2 times	50,000 points
7*	1 time	25,000 points

Capture Drop Target Release   Enter 0 thru 7;   This entry controls number of times Capture Drop Target is hit to initiate 3-ball play and also activates Release Hostage light (on right side of playfield).

ENTER	"RELEASE HOSTAGE" LIGHT	3-BALL PLAY
0	5 times	9 times
1	4 times	8 times
2	4 times	7 times
3	3 times	6 times
4*	3 times	5 times
5	2 times	4 times
6	2 times	3 times
7	1 time	2 times

Road Shot	Enter 0 or 1;	At start of new ball and off of ball shooter: 0*=Road Shot inactive. 1=Road Shot releases captive balls when Release Hostage light is flashing.

Special Set-up   Enter 0 thru 3;   This entry controls what combination of Road Value lights activate both Outlane Special lights

ENTER	ROAD VALUE
0	70K
1*	60K
2	50K
3	40K

Waste Rockets	Enter 0 or 1*;	This entry enables or disables "launch rocket" pushbuttons during the time respective Tank Drop Targets are already knocked down. 0=disables 1=enables
Game Over Hold Captive Balls	Enter 0 or 1*;	0=Eject Balls out of Capture Saucer; 1=Retain Balls
Attract Sound	Enter 0 or 1;	When game is over, this entry enables or disables Attract Sound Mode while displaying Hiscores or instructions. 0=No Sound, 1=Sound

PRICING OPTIONS

Chute 1 Options
XX coin for yy credit;   Coins (xx) will flash first. Enter 1 thru 99 coins. Then credits (yy) will flash. Enter 1 thru credit limit. Then coins will flash again. Either press Enter if the values are correct or repeat the data entry.

Chute 1 Bonus: Enter 0 thru 40; 0=No Bonus Credit
1 thru 40 sets the number of credits at which 1 Bonus Credit will be awarded.

Chute 2 Options
XX coin for yy credit;   Coins (xx) will flash first. Enter 1 thru 99 coins. Then credits (yy) will flash. Enter 1 thru credit limit. Then coins will flash again. Either press Enter if the values are correct or repeat the data entry.

Chute 2 Bonus: Enter 0 thru 40; 0=No Bonus Credit
1 thru 40 sets the number of credits at which 1 Bonus Credit will be awarded.

Chute 3 Options
XX coin for yy credit;   Coins (xx) will flash first. Enter 1 thru 99 coins. Then credits (yy) will flash. Enter 1 thru credit limit. Then coins will flash again. Either press Enter if the values are correct or repeat the data entry.

Chute 3 Bonus: Enter 0 thru 40; 0=No Bonus Credit
1 thru 40 sets the number of credits at which 1 Bonus Credit will be awarded.

Example:
To set Coin Chute 1 for 3 credits/2 Coins with no credits on the first coin;
Enter 02 Coin for 03 Credit Chute
    Chute 1 Bonus 00
To set it for 3 Credits/2 Coins with one credit delivered on the 1st coin and 2 credits delivered on the second.
Enter 01 Coin for 01 Credit
    Chute 1 Bonus 02
If all 3 Chute Options and Bonus Registers are set the same, then all Chutes will work "together."

*Factory Setting

V. RECOMMENDED 3 & 5 BALL OPTION SETTINGS

REPLAYS	3-BALL	5-BALL
Special Mode	3	3
Match Option	1	1
High Score Mode	3	3
1st replay at	1,000,000	2,500,000
2nd replay at	2,500,000	4,500,000
X-BALL		
Special Mode	2	2
Match Option	0	0
High Score Mode	0	0
1st Extra Ball at	1,000,000	2,500,000
2nd Extra Ball at	2,500,000	4,500,000
NOVELTY		
Special Mode	1	1
Match Option	0	0
High Score Mode	0	0

HIGH GAME TO DATE (reset periodically)
3-BALL 3,000,000   5-BALL 5,000,000

SPECIAL FORCE OPTION SETTINGS

FEATURE OPTIONS REGISTER	3-BALL	5-BALL
RECALL ROCKET	1	1
RECALL BOMB	1	1
RECALL ROAD VALUES	1	0
RECALL BONUS	1	1
RECALL MULTIPLIER	1	0
EXTRA BALL	7	4
CAPTURE DROP TARGET RELEASE	4	3
ROAD SHOT	0	0
SPECIAL SET-UP	1	2
WASTE ROCKETS	1	1
GAME OVER HOLD CAPTIVE BALLS	1	1
GAME OVER ATTRACT SOUND	1	1
In Basic Options:		
SLINGSHOT	1	1
TILT WARNING	1	1

VI. TROUBLESHOOTING ON LOCATION

SYMPTOM: WON'T POWER UP
Game does not play power-up tune when power is turned on. General illumination is present.

ACTION:
A. Check Fuses.
B. Turn power OFF. Open back box. Locate light emitting diode (LED) on Control Board.
C. Turn power ON. LED must flash 9X to indicate that the module is good. Correct sequence is flash-pause-flash and then seven more flashes and LED goes out.
D. If LED does not come on or does not flash, or flashes, but less than 9X, turn off power. Check fuses. If fuses are good, replace Control Board.

CAUTION: Replacement Control Board must have same Part Number or incorrect operation will result! See Parts List for Control Board.

Turn power ON.

E. If game is correct, it is now ready for play. If game is not correct, contact the Bally-Midway service department.

SYMPTOM: LAMPS
One or some switched lamps always ON or not all feature lamps light during play.

ACTION:
A. With power ON, open front door. Select SELF TEST-Lamp Tests with keyboard. If game is correct all feature lamps flash ON and OFF.
B. Carefully raise playfield or open back box to gain access to lamps.
C. Replace bulbs that do not flash.
D. If game is correct, it is now ready for play.
E. If game is not correct, turn power OFF. Replace Control Board. Turn power ON and repeat A.
F. If game is not correct, contact Bally-Midway service department.

SYMPTOM: DISPLAYS
I. Display digits improper on one or several, but less than all Display Driver Module(s). Improper: One or several segments always OFF, digits mottled or several segments or digit(s) always ON.

ACTION:
A. With power ON, open front door. Select SELF TEST-Display Test with keyboard. If the game is correct, each digit on each Display displays the count 0 through 9 and alphabet in all 7 digit positions. Note defective Display Driver modules.
B. Turn power OFF.

WARNING: High Voltage is supplied to the Display Driver Modules, from the Power Module. Wait 30 seconds for High Voltage to Bleed Off.

C. Replace Display Driver module(s). Turn power ON. Repeat A.
D. If game is correct, it is now ready for play. If game is not correct contact Bally-Midway service department.

II. All displays improper. Improper: Digit(s) always on or off/segment(s) always on or off, all displays.

ACTION:
A. With power ON, open front door. Select SELF TEST-Display Test with keyboard. If the game is correct, each digit on each Display displays the count 0 through 9 and alphabet in all 7 digit positions. Note defective Display Driver modules.
B. Replace Control Board. Turn power ON. Repeat A.

CAUTION: Replacement Control Board must have same Part Number or incorrect operation will result! See Parts List for Control Board.

C. If game is correct, it is now ready to play. If game is not correct, contact Bally-Midway service department.

III. One or several displays always off.

ACTION:
A. With power ON, open front door. Select SELF TEST-Display Test with keyboard. If the game is correct, each digit on each Display displays the count 0 through 9 and alphabet in all 7 digit positions. Note defective Display Driver modules.
B. Turn power OFF.
C. Replace Display Driver module(s). Turn power ON. Repeat A.
D. If game is correct, it is now ready for play. If game is not correct contact Bally-Midway service department.

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SYMPTOM: SOLENOIDS

I. One or more solenoids do not pull-in during course of game.

ACTION:

A. With power ON, open front door. Select SELF TEST-Solenoid Test with keyboard.

B. If game was correct, each solenoid would be energized. The Solenoid name appears with the Driver Q Number and connector jack and pin numbers. **(NOTE: If most of the Playfield Solenoids DO NOT operate, check the Playfield Fuse to see if it is blown. It is generally found near the Flipper Assemblies.)**

C. Carefully lift the playfield (or open the back box) to gain access to the solenoid. Turn power OFF. Inspect the solenoid.

D. If a lead is broken off, repair. Repeat A & B. If game is correct, it is now ready for play. If solenoid wiring was correct, turn power OFF.

E. Replace Control board. See CAUTION NOTE.

F. Repeat A & B. If game is correct, it is now ready to play. If game is not correct, turn power OFF.

G. Replace Sound Module A8.

H. Repeat A & B. If game is correct It is now ready for play. If game is not correct, contact the Bally-Midway service department.

II. Solenoid(s) are always energized. **NOTE:** If impulse solenoids (ball ejects, slingshots, thumper-bumpers, etc.) are energized continuously, they are subject to damage. Limit troubleshooting to one minute with power ON, followed by **five minutes with power OFF.** Repeat as necessary. Replace damaged solenoids. **(NOTE: When troubleshooting Playfield Solenoid Circuits, be advised that a constantly energized Solenoid (i.e. Thumper-Bumper) will blow the Playfield Fuse in a few seconds. To avoid replacing the Fuse repeatedly, try to isolate the faulty Solenoid Circuit as soon as the game power switch is flipped ON.)**

ACTION:

A. With power ON, open front door. Select SELF TEST-Solenoid Test with keyboard.

B. If game was correct, each solenoid would be energized. The Solenoid name appears with the Driver Q Number and connector jack and pin numbers. **(NOTE: If most of the Playfield Solenoids DO NOT operate, check the Playfield Fuse to see if it is blown. It is generally found near the Flipper Assemblies.)**

C. Carefully lift the playfield (or open the back box) to gain access to the solenoid. Turn power OFF. Inspect the solenoid.

D. If a lead is broken off, repair. Repeat A & B. If game is correct, it is now ready for play. If solenoid wiring was correct, turn power OFF.

E. Replace Control Board. See CAUTION NOTE.

F. Repeat A & B. If game is correct, it is now ready to play. If game is not correct, turn power OFF.

G. Replace Sound Module A8.

H. Repeat A & B. If game is correct, it is now ready to play. If game is not correct contact the Bally-Midway service department.

SYMPTOM: NO SOUND

ACTION:

A. With power ON, open front door. Select SELF TEST-Sound Test with the keyboard.

B. Turn volume control clockwise to Max.

C. If correct, sound will be heard. If incorrect, try seating speaker lead connector (J2) and input connector (J1).

D. If correct, sound will be heard. If incorrect, contact the Bally-Midway service department.

SYMPTOM: SWITCHES

Feature (Drop Targets, Stand-up, etc.) does not score.

ACTION:

A. With power ON, open front door. Select SELF TEST-Switch Test with the keyboard.

B. If game is correct, "All Switches Open" is displayed. Otherwise, the name of the switch(es) will be displayed with jack and pin numbers.

C. Carefully lift the playfield. Locate the switch assembly identified from the display. Visually inspect the switch assembly. If the contacts are stuck, re-gap them to 1/16." Repeat A & B. If the game is correct, it is now ready to play. If the game is not correct, turn power OFF.

D. Replace Control board. See CAUTION NOTE.

E. Repeat A & B. If game is correct, it is now ready to play. If game is not correct, contact the Bally-Midway service department.

CAUTION: Replacement Control Board must have the same Part Number or incorrect operation will result! See Parts List for Control Board.

GAME: MOTORDOME PINBALL & FUTURE GAMES

SUBJECT: 6803 CONTROL BOARD POWER UP TEST SEQUENCE

The following is an abbreviated self-test routine for the 6803 Control Board used in Motordome and future pinballs:

   1st Flash—(U1) Determine if the internal RAM is good. (6803)

   2nd Flash—(U2) Checks to see if the program ROM is good. (27128)

   3rd Flash—(U3) Checks to see if the program ROM is good. (27128)

   4th Flash—(U4) Checks the C-MOS RAM. (6116P-3)

   5th Flash—(U8) Tests PIA0. (6821)

   6th Flash—(U7) Tests PIA1. (6821)

   7th Flash—(U1) Checks the internal display interrupt generator. (6803)

   8th Flash—(U12 & U8) Verifies operation of the phase B switched ill. voltage. NOTE: F5 fuse on the Power Module provides the phase B signal to the Control Board. (U12, 14584) (U8, 6821)

   9th Flash—(U1, U11 & U12) Verifies operation of the Phase A switched ill. voltage. NOTE: F4 fuse on the Power Module provides the phase A signal to the Control Board. (U1, 6803) (U11, 4011) (U12, 14584)

The following is an abbreviated self-test routine for the 6809 Sound Board:

   1st Flash—(U7) Determines if the ROM is good.

   2nd Flash—(U6) Checks to see if the RAM is good.

   3rd Flash—(U8) Checks the PIA. (68B21)

The following is an abbreviated self-test routine for the Sounds Deluxe Board:

   1st Flash—Determines if the ROM (U11) is good.

   2nd Flash—Determines if the ROM (U12) is good.

   3rd Flash—Determines if the ROM (U13) is good.

   4th Flash—Determines if the ROM (U14) is good.

   5th Flash—Checks to see if the RAM (U9, U10) is good.

   6th Flash—Checks the PIA (6821) (U7).

FIGURE 1

SPECIAL FORCE
V8

SOLENOID IDENTIFICATION TABLE

SELF TEST # SEQUENCE	SOLENOID IDENTIFICATION
1	LEFT BUMPER
2	RIGHT BUMPER
3	MIDDLE BUMPER
4	LEFT SLINGSHOT
5	RIGHT SLINGSHOT
6	BRIGHT LITES 1
7	BRIGHT LITES 2
8	BRIGHT LITES 3
9	BRIGHT LITES 4
10	BRIGHT LITES 5
11	BRIGHT LITES 6 (NOT USED)
12	BRIGHT LITES 7 (NOT USED)
13	OUTHOLE
14	KNOCKER
15	IN-LINE DROP TARGETS UP
16	IN-LINE DROP TARGETS BOTTOM
17	IN-LINE DROP TARGETS MIDDLE
18	IN-LINE DROP TARGETS TOP
19	SAUCER
20	WEAPON DROP TARGET UP
21	WEAPON DROP TARGET DOWN
22	CAPTURE DROP TARGET
23	OUTHOLE EJECTOR
24	FLIPPER (BACKBOX)

SWITCH ASSEMBLY IDENTIFICATION TABLE

SWITCH SELF TEST # SEQUENCE	DESCRIPTION
1	COLLECT WEAPON
2	CHOPPER TOP
3	CHOPPER BOTTOM
4	REBOUND
5	LEFT LAUNCH (LT. ORANGE P.B.)
6	NEW GAME
7	RIGHT LAUNCH (RT. ORANGE P.B.)
8	OUTHOLE REGULAR
9	RIGHT COIN DOOR
10	LEFT COIN DOOR
11	MIDDLE COIN DOOR
12	LEFT OUTLANE
13	RIGHT OUTLANE
14	SLAM
15	TILT (CABINET)
16	RELEASE LEFT (BEHIND IN-LINE D.T.)
17	ROCKET 'R'
18	ROCKET 'O'
19	ROCKET 'C'
20	ROCKET 'K'
21	ROCKET 'E'
22	ROCKET 'T'
23	SAUCER CAPTURE 1
24	SAUCER CAPTURE 2
25	LEFT BUMPER
26	RIGHT BUMPER
27	MIDDLE BUMPER
28	LEFT SLINGSHOT
29	RIGHT SLINGSHOT
30	RIGHT OUTHOLE
31	MIDDLE OUTHOLE
32	LEFT OUTHOLE
33	BOMB 'B'
34	BOMB 'O'
35	BOMB 'M'
36	BOMB 'B'
37	NOT USED
38	COLLECT BONUS
39	NOT USED
40	WEAPON DROP TARGET
41	AUXILIARY CAPTIVE (NEAR SAUCER)
42	RETURN LANES
43	BONUS MULTIPLIER
44	LOAD BOMBS
45	IN-LINE DROP TARGET (BOTTOM)
46	IN-LINE DROP TARGET (MIDDLE)
47	IN-LINE DROP TARGET (TOP)
48	ROAD SWITCH

*NOTE: SEQUENCE NUMBERS SHOWN HERE ARE USED AS AN AID IN LOCATING FAULTY SOLENOID OR SWITCH USING DRAWING SHOWN.

VECTOR SHOWING FOR EJECT SAUCER BALL SHOULD EXIT AS SHOWN.

VIII. ROUTINE MAINTENANCE ON LOCATION:

After successful completion of the Self Diagnostic Test Procedure, set the game up for play. Exercise each roll-over, thumper bumper, slingshot, etc., by hand until each switch assembly on the playfield has been checked for proper operation. If actuating a switch assembly results in intermittent or no response, clean contacts by gently closing them on a clean business card or piece of paper and wiping until they wipe clean. Re-gap, if necessary, to 1/16". Do not burnish the Gold Plated Switch Contacts.

IX. SWITCH ASSEMBLY ADJUSTMENTS:

GENERAL:

All switch assemblies consist of leaf springs, contacts, separators, plastic tubing and screws to hold them to the mounting surface. Before attempting to adjust a switch assembly, make sure that these screws are tight. If not, tighten screw closest to the contact end of the leaf spring first. This will prevent the assembly from being secured in such a manner that the leaf springs tend to fan out. In general, all leaf springs are adjusted for a 1/16" gap in the open position and .010" over-travel or wipe in the closed position. All contacts should be in good condition. Unless otherwise instructed, they should be dry or non-lubricated. All contacts should be free of dust and dirt. Contacts, with the exception of the flipper button switch assemblies are plated to resist corrosion. Filing or burnishing breaks the finish and encourages corrosion. Clean by closing the contacts over a clean piece of paper (e.g. a lint free business card) and wiping gently until the contacts are clean. For the flipper button switch assemblies ONLY: Tarnish can be removed with a contact file followed by burnishing tool. Severely pitted contacts must be placed and adjusted only when they are found to be a source of game malfunction.

X. SERVICE HINTS:

The Bally playfield has an improved tuff-coat finish with excellent wearing properties. Life expectancy of the playfield as well as play appeal, can be extended by periodic cleaning.

DO: Bally recommends you clean your playfield with Wildcat #125 (Wildcat Chemical Co. 1349 East Seminary Drive; Fort Worth, Texas 76115; Phone 1-817/924-8321). Wildcat #125 is a combination cleaner and polish. Bally has tried and tested this product and found it to be very effective. If Wildcat #125 is not available, Bally suggests you ask your distributor to order it. Inspect and hand polish the ball in a clean cloth. A chipped ball must be replaced. It can ruin the ball on the playfield in a short period of time.

DON'T: Use water in large quantities, highly caustic cleaners, abrasive cleaners and cleaning pads on the playfield, or allow a wax or polish build up. Waxes yellow with age and spoil appeal.

FIGURE 6

1-11

CE47 SPECIAL FORCE
PANEL TOP PARTS (Without Ramps)
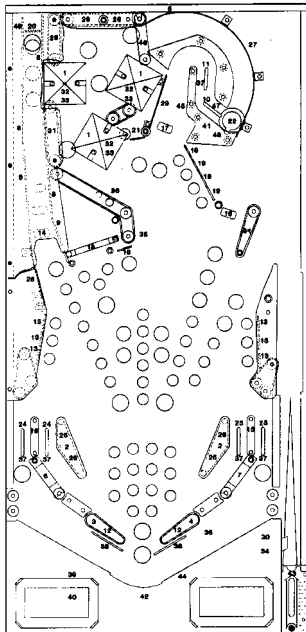
1.	THUMPER BUMPER	A967-00053-0100
2.	SLINGSHOT KICKER ASSY.	A967-00059-0000
3.	FLIPPER ASSY. SINGLE BW. LT.	AC70-00022-0200
4.	FLIPPER ASSY. SINGLE SW. RT.	AC70-00022-0100
5.	BACKBOARD ASSY.	AE47-00021-0000
6.	GATE & BRKT. ASSY.	A370-00053-0000
7.	BALL GATE, WIRE & BRKT. ASSY.	A370-00052-0000
8.	WIRE-FORM BALL GUIDE	0365-00151-6500
9.	WIRE-FORM BALL GUIDE	0365-00151-3125
10.	WIRE ACTUATOR ASSY. (RIGHT)	A360-00216-0000
11.	WIRE ACTUATOR ASSY. (LEFT)	A331-00042-0000
12.	MOLDED FLIPPER ASSY. (BLACK)	A967-00031-0100
13.	SWITCH W/TARGET, BRKT. & DIODE ASSY.	A365-R0300-B113
14.	DROP TARGET 3 IN-LINE W/MEMORY	AE47-00029-0000
15.	BALL CHANNEL ASSY.	AE47-00018-0000
16.	DROP TARGET SINGLE IN-LINE W/MEMORY	AE47-00023-0000
17.	DROP TARGET ASSY.	AE47-00028-0000
18.	WIRE-GATE ASSY.	AE14-00013-0000
19.	SWITCH W/TARGET, BRKT. & DIODE ASSY.	A365-R0300-B111
20.	SWITCH W/TARGET, BRKT. & DIODE ASSY.	A365-R0300-B115
21.	SWITCH W/TARGET, BRKT. & DIODE ASSY.	AE47-00042-0000
22.	BALL EJECT ASSY.	AE47-00033-0000
23.	WIRE ACTUATOR ASSY. (RIGHT)	A360-00215-0000
24.	WIRE ACTUATOR ASSY. (LEFT)	A967-00067-0000
25.	SLINGSHOT SWITCH & BRKT. ASSY.	A360-00230-0000
26.	SWITCH & DIODE ASSY.	A360-00239-0000
27.	BALL GUIDE ASSY. (SMALL)	AE47-00022-0000
28.	BALL GUIDE ASSY. (SMALL)	AE47-00031-0000
29.	BALL GUIDE ASSY. (SMALL)	AE47-00032-0000
30.	BALL CHANNEL GATE ASSY.	AA40-00027-0000
31.	SWITCH & BRKT. ASSY.: W/DIODE	A360-00239-0100
32.	COLLAR: THUMPER BUMPER	0365-00165-00XF
33.	HUT ROOF: THUMPER BUMPER	0E47-00912-0000
34.	BALL GATE ASSY.	AA40-00019-0000
35.	SWITCH, DIODE & PLATE ASSY. W/CAP	A360-00245-0100
36.	SOLENOID EXPANDER P.C. BD. ASSY.	B084-91618-A000
37.	SWITCH, DIODE & PLATE ASSY.	A365-00035-0000
38.	WIRE-FORM BALL GUIDE	0365-00175-5300
39.	TOP-MTG. KICKER ASSY.	A360-00234-0000
40.	SWITCH & DIODE ASSY. (OUTHOLE)	A365-00241-0000
41.	SWITCH, DIODE & PLATE ASSY. (EJECT HOLE)	A365-00036-0000
42.	BOTTOM ARCH	0E47-00109-00XF
43.	SHOOTER GAUGE	0E47-00110-00XF
44.	BOTTOM ARCH EXTENSION	0370-00918-0300
45.	MICROSWITCH & BRKT. ASSY.	AE47-00038-0000
46.	GATE & FREE WIRE ASSY.	AA40-00033-0000
47.	SWITCH, DIODE & PLATE ASSY. W/CAP	A365-00035-0100
48.	SAUCER SWITCH ROLLOVER ASSY.	A365-00215-0100
49.	WIRE FORM: BALL GUIDE	0365-00151-1750

OE47 SPECIAL FORCE

PLASTIC RAMP PARTS

1. HELICOPTER-RAMP ASSY. AE47-00025-0000
   (NOT SHOWN)
2. ENTRANCE-RAMP ASSY. AE47-00026-0000
   (NOT SHOWN)
3. WEAPONS-RAMP ASSY. AE47-00027-0000
   (NOT SHOWN)

RUBBER RINGS

A. RING: 0017-00041-0633
B. RING: 5/16"   0017-00041-0637
C. RING: 15/64"   0017-00041-0641
D. RING: 1"   0017-00041-0643
E. RING: 1-1/2"   0017-00041-0644
F. RING: 2"   0017-00041-0645
G. RING: 2-1/2"   0017-00041-0646
H. RING: 3"   0017-00041-0647
J. RING: (YELLOW): 3"   0017-00041-0648

POST

K. POST (GREEN PLASTIC): 1" 0017-00042-0714
L. METAL MINI-POST   0360-00732-00XF
   (W/THREADS FOR WOOD)
M. METAL POST   0360-00733-00XF
   (NO THREADS)
N. METAL MINI-POST   0365-00700-00XF
   (W/THREADS FOR 10-32 NUT)

RUBBER BUMPER FOR

L & N—METAL MINI-POST   0017-00041-0633
K   —PLASTIC POST   0017-00041-0637
M   —METAL POST   0017-00041-0641
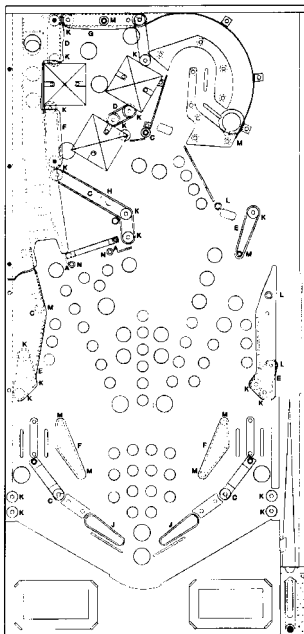
FIGURE 5a
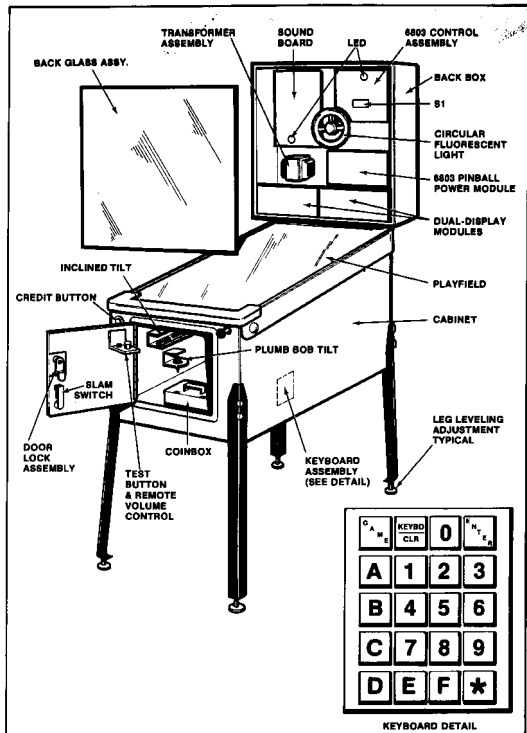
FIGURE III. ELECTRONIC PIN BALL MACHINE

XI. SPECIAL FORCE FEATURE OPERATION AND SCORING

1. SHOOTER LANE SKILL SHOT FEATURE
At the start of each ball, the skill shot is scored by making the Collect Weapon switch (on the Weapons Ramp) from the Shooter Lane via the Road Ramp which is located on the right side of the playfield. Three Rockets, one Bomb and 25,000 points are awarded.

2. ROCKET FEATURE
At the start of each ball, 2 Rockets are awarded. Spelling R-O-C-K-E-T, by completing 6 stand-up targets, awards 1 Rocket. For each letter, 5,000 points when lit and 7,000 points when flashing. Each Return Lane spots 1 letter in R-O-C-K-E-T. A "Rockets Collected" count is provided by a group of 4 yellow lights, located above the flippers, numbered "1", "2", "4", and "8".

Below each Flipper push button is a push button that "fires" Rockets. The left "Launch Rocket" push button "fires" a rocket to inline "Tank" drop targets located in the Left Lane, the right "Launch Rocket" push button "fires" a Rocket to a single "Tank" Drop Target located on the right at the entrance to the Weapon Ramp. Rockets will knock down "Tank" Drop Targets. Firing a Rocket and hitting a Tank scores 10,000 points. Firing a Rocket to where a Tank has already been knocked down is "wasting a Rocket" which scores 5,000 points (adjustable).

- **REGISTER "Waste Rockets"** enables or disables "Launch Rocket" push buttons during the time respective Weapon Drop Targets are already knocked down.

"LAUNCH ROCKET" PUSH BUTTONS ENABLED	ENTER
NO	0
YES	1

- **REGISTER "Recall R-O-C-K-E-T"** controls the R-O-C-K-E-T Recall:

R-O-C-K-E-T RECALL	ENTER
NO	0
YES	1

3. BOMB FEATURE
At the start of each ball, one Bomb is awarded. Spelling B-O-M-B, by completing 4 stand-up targets, awards one Bomb. Each letter in "B-O-M-B" awards 7,000 points when flashing, 5,000 points when lit. A "Bombs Collected" count is provided by a group of 4 red lites, located above the flippers, numbered "1", "2", "4", and "8".

When the player has at least 1 Bomb, the "Load Bombs" target lite will flash. Hitting the "Load Bombs" stand-up target at this point "loads" a Bomb "onto the Helicopter" (see Helicopter Ramp Feature) and lights one of 3 red lights in front of the Helicopter Ramp. A maximum of 3 Bombs can be loaded. "Loading" a Bomb awards 2,000 points. "Dropping" a Bomb awards 10,000 points by making the "Chopper Top" switch and the "Chopper Bottom" switch. "Dropping" a Bomb (making the Helicopter Ramp with at least one "loaded" Bomb will light a Thumper Bumper for 1,000 points. After all Thumper Bumpers are lit, dropping another Bomb will flash the Thumper Bumper lights for 3,000 points.

- **REGISTER "Recall B-O-M-B"** controls the B-O-M-B Recall:

B-O-M-B RECALL	ENTER
NO	0
YES	1

4. HELICOPTER RAMP FEATURE
The Helicopter Ramp is completed by making the "Chopper Top" switch and "Chopper Bottom" switch. When the ball makes the "Chopper Top" switch, points are accumulated by use of a timer to a maximum of 51,000 points. The timer is interrupted, stopping the point accumulation, by the ball making the "Chopper Bottom" switch after spinning around in the funnel portion of the Helicopter Ramp.

5. WEAPON FEATURE
Making the Weapons Ramp's "Collect Weapon" switch behind the single "Tank" Drop Target awards one Rocket, increases the "Weapon Bonus" and awards 25,000 points. The "Weapon Bonus" starts at 25,000 points and advances to a maximum of 250,000 points each time a shot is made. A "Weapon Bonus Collected" count is provided by a group of 4 green lights, located above the flippers, numbered (in thousands): "25", "50", "75", and "100".

6. ROAD RAMP FEATURE

Making the Road Ramp's "Road Shot" switch releases "Hostages" (see Hostage Feature) when the "Release Hostage" light, located at the Road Ramp entrance, is lit. It also awards the "Weapon Bonus" value each time the Road Shot is made. The Road Values also increase, with each Road Shot made, in steps of 10,000 points, to a maximum of 70,000 points.

- **REGISTER "Recall Road Values"** recalls the Road Value lights numbered (in thousands) "10", "20", and "40".

ROAD VALUE RECALL	ENTER
NO	0
YES	1

- **REGISTER "Road Shot"** at the start of each ball and only off of the Ball Shooter, controls the release of "captive" balls by making the Road Shot while the "Release Hostage" light is flashing.

- **REGISTER "Special Set-up"** controls what combination of Road Value lights activate both Outlane Special lights:

ROAD VALUE	ENTER
70K	0
60K	1
50K	2
40K	3

7. HOSTAGE FEATURE

Hitting the Capture Drop Target lights the Collect Bonus light and scores 10,000 points. Shooting the ball into the alley (behind the Capture Drop Target) with it landing in the hidden Capture Saucer awards the current Bonus Value and captures a "hostage"—a "captive" ball. A new ball is released to the Ball Shooter. The "Lite Release Hostage" light will start flashing in the Left Lane. Making the standing target in the Left Lane will light the "Release Hostage" light by the Road Ramp. Making the Road Ramp with "Release Hostage" light lit will "release the hostages" for multi-ball play. A maximum of 2 hostages (2 balls) can be captured and held before being released.

The "Release Hostage" light can also be lit by hitting the Capture Drop Target 2 times (adjustable). With a new ball from the Ball Shooter, making the Road Shot "can release" captive balls, while the "Release Hostage" light is flashing (adjustable-see REGISTER "Road Shot").

- **REGISTER "Recall Bonus"** recalls Bonus lights numbered (in thousands): "1", "2", "4", "8", and "16".

BONUS RECALL	ENTER
NO	0
YES	1

- **REGISTER "Capture Drop Target Release"** controls the number of times the Capture Drop Target is hit to initiate 3-ball play and also activitates the "Release Hostage" light (on the right side of the playfield).

ACTIVITATES "RELEASE HOSTAGE" LIGHT	INITIATES 3-BALL PLAY	ENTER
5 Times	9 Times	0
4 Times	8 Times	1
4 Times	7 Times	2
3 Times	6 Times	3
3 Times	5 Times	4
2 Times	4 Times	5
2 Times	3 Times	6
1 Time	2 Times	7

- **REGISTER "Game Over Hold Captive Balls"** controls whether or not the Capture Saucer will eject "captive" balls.

CAPTURE SAUCER	ENTER
Eject Balls	0
Retains Balls	1

8. BONUS MULTIPLIER FEATURE

When the "Lite Bonus X" light is flashing and after knocking down the 3 in-line "Tank" Drop Targets in the Left Lane, hitting the standing target will light the "Bonus X" light and score 10,000 points. Hitting the "Bonus X" target while "Bonus X" light is lit will advance the Bonus Multiplier 2X thru 5X.

- **REGISTER "Recall Multiplier"** recalls Bonus Multiplier lights: 2X, 3X, 4X, and 5X.

BONUS MULTIPLIER RECALL	ENTER
NO	0
YES	1

9. EXTRA BALL FEATURE

Making the Weapons Ramp 2 times (adjustable) lights the "Lite Extra Ball" in the Left Lane. After knocking down the 3 in-line "Tank" Drop Targets, hitting the standing target in the Left Lane will lite the "Extra Ball" light in front of the Weapons Ramp. Making the Weapons Ramp again will award the Extra Ball.

- **REGISTER "Extra Ball"** controls the number of times the Weapons Ramp must be completed to activate the "Lite Extra Ball" light in the Left Lane.

WEAPONS RAMP	WEAPONS BONUS VALUE	ENTER
8 Times	200,000 points	0
7 Times	175,000 points	1
6 Times	150,000 points	2
5 Times	125,000 points	3
4 Times	100,000 points	4
3 Times	75,000 points	5
2 Times	50,000 points	6
1 Time	25,000 points	7

10. ESCAPE BONUS FEATURE

During multiball play, the "Set Explosive" light, located between the flippers, is flashing. Making any ramp or the standing target in the Left Lane will award 100,000 points and start the "Escape" light, located in front of the Helicopter Ramp, flashing. "Escape Bonus" is then displayed in the backbox. This bonus starts at 500,000 points and builds, during multiball play, to 2,000,000 points. The "Escape Bonus" is awarded when the Helicopter Ramp is made.

11. MISCELLANEOUS FEATURES

Knocking down any "Tank" Drop Target, with a ball, awards 15,000 points.

Each Outlane awards 1,000 points.

Each Flipper Lane awards 10,000 points and also spots one letter in R-O-C-K-E-T.

Each Thumper Bumper awards 100 points unlit, 1,000 points when lit, and 3,000 points when flashing.

Each Sling Shot awards 30 points.

Each Rebound awards 10 points.

- **REGISTER "Attract Sound"** enables or disables, when the game is over, the Sound Mode while displaying Hiscore or instructions.

ENABLES SOUND MODE	ENTER
NO	0
YES	1

In Basic Options:

- **REGISTER "Sling Shot"** controls the Sling Shot:

SLING SHOTS ACTIVE	ENTER
NO	0
YES	1

- **REGISTER "Tilt Warning"** controls the number of Tilt Warnings:

# OF TILT WARNINGS	ENTER
NONE	0
1	1
2	2
3	3

1-16

SECTION 2
Component Layouts, Schematics & Wiring Diagrams

DESIGNATION LIST

DESIGNATION	DESCRIPTION	DESIGNATION	DESCRIPTION
C1	11,000uf 20V ELEC.	JW1 - JW16	ZERO OHM RES. JUMPER
P/O C1	TY-WRAP	TP1 - TP10	TEST POINTS
P/O C1	SOLDER LUG	F1*	5 AMP 3AG FUSE
P/O C1	WIRE 20AWG	F2	3/4 AMP 3AG FUSE
C2	160uf 350V ELEC.	F3	6 AMP 3AG FUSE
P/O C2	TY-WRAP	F4, F5	8 AMP 3AG FUSE
C3	2uf 25V ELEC.	F6, F7	15 AMP 3AG FUSE
C4, C5	.1uf 25V CER.	F8	3/16 AMP 8AG FUSE
C6, C7	.01uf 500V CER.	FC1A - FC3B, FC8A	FUSE CLIPS
R1	600 OHM 10W	FC8B	
R2	100K 1W 5%	FC4A - FC7B	FUSE CLIPS
R3	2.2 OHM 1/4W 5%	J1	12 PIN M-N-L CONN. FEMALE
R4	100 OHM 1/2W 5%	J2	6 PIN M-N-L CONN. MALE
R5	22K 1/2W 5%	J3	15 PIN M-N-L CONN. MALE
R6	100K 1/4W 5%	J4	9 PIN M-N-L CONN. MALE
R7	390 OHM 1/4W 5%	J5	12 PIN M-N-L CONN. MALE
R8	1.2K 1/4W 5%	J6	2 PIN M-N-L CONN. MALE
R9	82K 1/2W 5%	6803 POWER MODULE	P.C. BOARD
R10	8.2K 1/4W 5%		
VR1	0 - 25K 1/4W POT.	4-23-86 REV. 1.0 FIXED R2, R6	
D1 - D4	MR751		
D5 - D9	1N4004		
D10	1N5275A ZENER		
BR1	KBPC-35-02-W	* TWO FLIPPER GAMES ONLY - SEE SCHEMATIC
P/O BR1	BRIDGE SPACER		
Q1	2N3584		
P/O Q1	SHIELD		
P/O Q1	HEX SPACER		
P/O Q1	6-32 X 5 SCREW		
P/O Q1	6-32 X 12 SCREW		
P/O Q1	LOCKWASHER EXT.		
P/O Q1	LOCKWASHER INT.		
P/O Q1	FLAT WASHER		
P/O Q1	6-32 HEX NUT		
P/O Q1	LABEL - CAUTION HIGH VOLT.		
P/O Q1	HEATSINK 2		
P/O Q1	INSULATOR TO-66		
Q2, Q3	2N3440		
P/O Q2, Q3	INSULATOR TO-5		
P/O Q3	HEATSINK 3		
U1	78H05C REG.		
P/O U1	6-32 X 12 SCREW		
P/O U1	6-32 HEX NUT		
P/O U1	LOCKWASHER EXT.		
P/O U1	FLAT WASHER		
P/O U1	HEATSINK 1		
P/O U1	INSULATOR TO-3		
VA1	VARISTOR		

CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
.01UF 500V CER.	2	C6,C7	0360-00800-0013
.1UF 25V CER.	2	C4,C5	0360-00800-0026
2UF 25V ELEC.	1	C3	0360-00800-0019
160UF 350V ELEC.	1	C2	0360-00800-0020
11,000UF 20V ELEC.	1	C1	0360-00800-0024
2.2 OHM 1/4W 5%	1	R3	100E-00005-0003
100 OHM 1/2W 5%	1	R4	100E-00006-0021
390 OHM 1/4W 5%	1	R7	100E-00005-0049
600 OHM 10W 10%	1	R1	100E-00002-0049
1.2K 1/4W 5%	1	R8	100E-00005-0063
8.2K 1/4W 5%	1	R10	100E-00005-0086
22K 1/2W 5%	1	R5	100E-00006-0065
82K 1/2W 5%	1	R9	100E-00006-0072
100K 1/4W 5%	1	R6	100E-00005-0115
100K 1W 5%	1	R2	100E-00007-0037
0-25K 1/4W POT	1	VR1	0360-00804-0004
MR 751	4	D1-D4	103E-00003-0016
1N4004	5	D5-D9	103E-00003-0005
1N5275	1	D10	103E-00001-0027
KRPC-35-02-W	1	RR1	103E-00003-0005
2N3440	2	Q2,Q3	104E-00005-0002
2N3584	1	Q1	104E-00005-0002
78H05C REG	1	U1	0360-00803-0021
VARISTOR METAL OXIDE 60V	1	VA1	115E-00001-0002
TY-WRAP	4	P/O C1,C2	0017-00042-0048
ZERO OHM RES. JUMPER	16	JW1-JW16	117E-00001-0001
TEST POINTS	10	TP1-TP10	0017-00007-0131
SOLDER LUG	2	P/O C1	0017-00021-0257
JUMPER WIRE 20AWG	2	P/O C1	0017-00033-0448
INSULATOR TO-3	1	P/O U1	0017-00042-0119
INSULATOR TO-5	2	P/O Q2,Q3	0017-00042-0151
INSULATOR TO-66	1	P/O Q1	0017-00042-0158
HEX SPACER	2	P/O Q1	0017-00042-0248
SHIELD	1	P/O Q1	0365-00952-0000
HEATSINK 1	1	P/O U1	112E-00001-0003
HEATSINK 2	1	P/O Q1	112E-00001-0002
HEATSINK 3	1	P/O Q3	112E-00001-0004
BRIDGE SPACER	1	P/O RR1	118E-00001-0001
6-32 X 12 SCREW	4	P/O Q1,U1	0017-00101-0132
6-32 X 5 SCREW	2	P/O Q1	0017-00101-0555
6-32 HEX NUT	4	P/O Q1,U1	0017-00103-0005
LOCKWASHER INT.	4	P/O Q1,	0017-00104-0008
LOCKWASHER EXT.	4	P/O Q1,U1	0017-00104-0009
FLAT WASHER	4	P/O Q1,U1	0017-00104-0106
FUSE CLIP	8	FC1A-FC3B, FCRA,FCRB	0017-00071-0033
FUSE CLIP	8	FC4A-FC7A	0017-00071-0034
3/16 AMP 3AG FUSE	1	F8	0017-00003-0206
3/4 AMP 3AG FUSE	1	F2	0017-00003-0010
5 AMP 3AG FUSE	1	F1*	0017-00003-0175
6 AMP 3AG FUSE	1	F3	0017-00003-0008

CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
8 AMP 3AG FUSE	2	F4,F5	0017-00003-0387
15 AMP 3AG FUSE	2	F6,F7	0017-00003-0011
12 PIN M-N-L CONN. FEMALE	1	J1	0017-00021-0532
6 PIN M-N-L CONN. MALE	1	J2	0017-00021-0424
15 PIN M-N-L CONN. MALE	1	J3	0017-00021-0434
9 PIN M-N-L CONN. MALE	1	J4	0017-00021-0425
12 PIN M-N-L CONN. MALE	1	J5	0017-00021-0426
2 PIN M-N-L CONN. MALE	1	J6	0017-00021-0488
6803 POWER MODULE P.C.B.	1		A080-91785-D000

* TWO FLIPPER GAMES ONLY - SEE SCHEMATIC

6803 Pinball Power Module Schematic Drawing
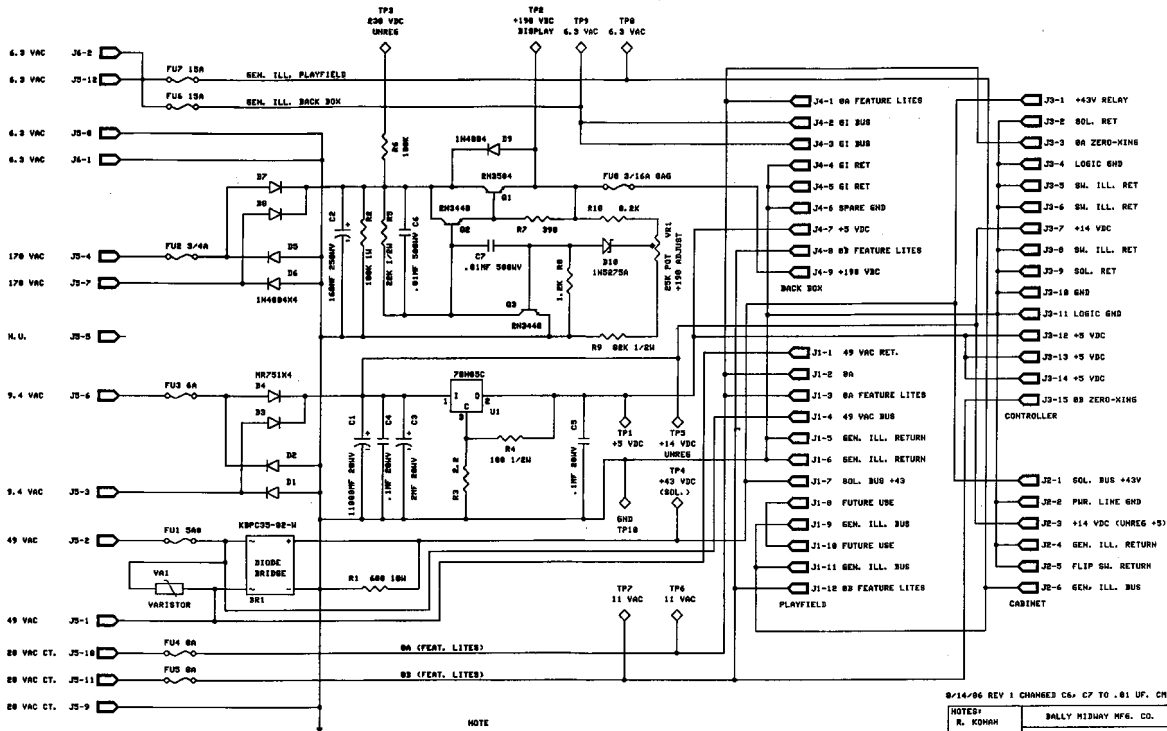
NOTE:
WHEN 3 FLIPPERS ARE USED FU1 SHOULD BE 6AMP
WHEN 4 FLIPPERS ARE USED FU1 SHOULD BE 7AMP

8/14/86 REV 1 CHANGED C6, C7 TO .01 UF. CMM

NOTES: R. KOMAN	BALLY MIDWAY MFG. CO.
1 PER 03/11/86	6803 PINBALL PWR MODULE SCHEMATIC DRAWING A084-91785-B000 M051-00C33-0002
	SHEET 1 OF 1 REV

2-3

A084-91864-C000

REL FER PRODUCTION

CM-7

REVISIONS

USED ON Pinball

NO. REQ'D

Bally / MIDWAY MFG. CO.
FRANKLIN PK. ILL.

ASSEMBLY DRAWING
SOUNDS DELUXE P.C. BD.
A084-91864-C000

PART NO. M051-00114-C153

-4

SOUNDS DELUXE
A084-91864-C000
M051-00114-C154   Rev. 4

DESIGNATION LIST

DESIGNATION	DESCRIPTION
CP1,CP2	.1 UF CER
CP3-CP13	.01 UF AX CER
C1	.1 UF AX CER
C2	10 UF RD TANT
C3-C5	NOT INSERTED
C6	470 PF AX CER
C7-C10	100 PF AX CER
C11	.01 UF AX CER
C12	47 UF AX ELEC
C13	470 UF AX CER
C14	1 UF AX TANT
C15	.01 UF AX CER
C16	68 PF AX CER
C17	.1 UF AX TANT
C18	.001 UF AX CER
C19	82 PF AX CER
C20	10 UF AX TANT
C21	1 UF AX TANT
C22	.05 UF RD CER
C23	470 UF AX ELEC
C24	1000 UF AX ELEC
C25	.1 UF AX CER
C26,C27	.22 UF AX CER
C28-C30	.1 UF AX CER
C31	4700 UF AX ELEC
C32	.01 UF AX CER
C33,C34	4.7 UF RD TANT
C35	.01 UF AX CER
C36	NOT INSERTED
C37	10 UF AX TANT
C38	.01 UF AX CER
C39	.1 UF AX CER
D1	NOT INSERTED
D2	VR330
D3,D4	1N4004
D5-D8	NOT INSERTED
D9,D10	1N4004
FB1-FB3	FERRITE BEAD
HS U15	HEATSINK TO-220
HS U17	HEATSINK TO-220
ICS U3	64 PIN I.C. SOCKET
ICS U4	20 PIN I.C. SOCKET
ICS U7	40 PIN I.C. SOCKET
ICS U8	16 PIN I.C. SOCKET
ICS U9-U14	28 PIN I.C. SOCKET

DESIGNATION	DESCRIPTION
INS U15, INS U17	SIL PAD THERMAL WASHER
J1,J2	AUTO INSERT PIN TIN .045 SQ.
JW1-JW12	JUMPER WIRE
L1,L2	10 UH INDUCTOR
LED 1	GREEN LED
MH U15	SCREW, 6-32
MH U15	NUT, 6-32
MH U15	WASHER, #6 STAR
MH U17	SCREW, 4-40
MH U17	NUT, 4-40
MH U17	WASHER, #4 STAR
Q1,Q2	2N5305
Q3-Q6	NOT INSERTED
R1-R8	4.7K OHM 1/4W CRBN
R9	NOT USED
R10-R12	NOT INSERTED
R13	10K OHM 1/4W CRBN
R14	100K OHM 1/4W CRBN
R15-R18	10K OHM 1/4W CRBN
R19	47K OHM 1/4W CRBN
R20	100 OHM 1/4W CRBN
R21-R23	4.7K OHM 1/4W CRBN
R24	2.7K OHM 1/4W CRBN
R25	180 OHM 1/4W CRBN
R26	68 OHM 1/4W CRBN
R27	62K OHM 1/4W CRBN
R28	120K OHM 1/4W CRBN
R29	75K OHM 1/4W CRBN
R30	33K OHM 1/4W CRBN
R31	18K OHM 1/4W CRBN
R32	33K OHM 1/4W CRBN
R33	47K OHM 1/4W CRBN
R34	150K OHM 1/4W CRBN
R35	82K OHM 1/4W CRBN
R36	150K OHM 1/4W CRBN
R37	200K OHM 1/4W CRBN
R38	1K OHM 1/4W CRBN
R39	33K OHM 1/4W CRBN
R40	430 OHM 1/4W CRBN
R41	220 OHM 1/4W CRBN
R42	2.2 OHM 1/4W CRBN

SOUNDS DELUXE
A084-91864-C000
MQ51-00114-C154   Rev. 4

SOUNDS DELUXE
A084-91864-C000
MQ51-00114-C154   Rev. 4

DESIGNATION LIST

DESIGNATION	DESCRIPTION
R43	1 OHM 1/4W CRBN
R44-R58	NOT INSERTED
R59	4.7K OHM 1/4W CRBN
R60	10K OHM 1/4W CRBN
SW1	PC MTG. SWITCH
TP1,TP2	TEST POINT
U1	16 MHZ COSC
U2	74LS74
U3	MC68000G8 CPU
U4	PAL16L8A-2 SD00RO
U5	74LS05
U6	74F32
U7	MC6821
U8	AD7533 DAC
U9,U10	RAM 2K X 8
U11-U14	ROM/EPROM
U15	TDA2002
U16	LM3900
U17	MC7805 REG.
U18	TL7705
VR1	10K POT.

CROSS REFERENCE

DESCRIPTION	QTY.	DESIGNATION	PART NUMBER
68 PF AX CER 5%	1	C16	0360-00800-0028
82 PF AX CER 5%	1	C19	0E47-00800-0002
100 PF AX CER	4	C7-C10	0360-00800-0046
470 PF AX CER 10%	2	C6,C13	0307-00800-0008
.001 UF AX CER 10%	1	C18	0E47-00800-0003
.01 UF AX CER 10%	1	C15	0E47-00800-0001
.01 UF AX CER	15	CP3-CP13,C11,C32 C35,C38	0360-00800-0005
.05 UF RD CER	1	C22	0360-00800-0006
.1 UF AX CER	8	CP1,CP2,C1,C25, C28-C30,C39	0360-00800-0058
.22 UF AX CER	2	C26,C27	0360-00800-0057
1 UF AX TANT	3	C14,C17,C21	0986-00R00-1400
4.7 UF RD TANT	2	C33,C34	0360-00800-0008
10 UF AX TANT	3	C2,C20,C37	0986-00R00-0700
47 UF AX ELEC	1	C12	0360-00800-0042
470 UF AX ELEC	1	C23	0360-00800-0021
1000 UF AX ELEC	1	C24	0360-00800-0044
4700 UF AX ELEC	1	C31	0360-00800-0023
1 OHM 1/4W CRBN	1	R43	100E-00005-0002
2.2 OHM 1/4W CRBN	1	R42	100E-00005-0003
68 OHM 1/4W CRBN	1	R26	100E-00005-0029
100 OHM 1/4W CRBN	1	R20	100E-00005-0033
180 OHM 1/4W CRBN	1	R25	100E-00005-0039
220 OHM 1/4W CRBN	1	R41	100E-00005-0041
430 OHM 1/4W CRBN	1	R40	100E-00005-0050
1K OHM 1/4W CRBN	1	R38	100E-00005-0061
2.7K OHM 1/4W CRBN	1	R24	100E-00005-0071
4.7K OHM 1/4W CRBN	12	R1-R8,R21-R23,R59	100E-00005-0079
10K OHM 1/4W CRBN	6	R13,R15-R18,R60	100E-00005-0088
18K OHM 1/4W CRBN	1	R31	100E-00005-0093
33K OHM 1/4W CRBN	3	R30,R32,R39	100E-00005-0100
47K OHM 1/4W CRBN	2	R19,R33	100E-00005-0104
62K OHM 1/4W CRBN	1	R27	100E-00005-0107
75K OHM 1/4W CRBN	1	R29	100E-00005-0110
82K OHM 1/4W CRBN	1	R35	100E-00005-0112
100K OHM 1/4W CRBN	1	R14	100E-00005-0115
120K OHM 1/4W CRBN	1	R28	100E-00005-0118
150K OHM 1/4W CRBN	2	R34,R36	100E-00005-0120
200K OHM 1/4W CRBN	1	R37	100E-00005-0123
10K POT	1	VR1	0360-00804-0024
1N4004	4	D3,D4,D9,D10	103E-00003-0005
VR330	1	D2	0360-00801-0007

SOUNDS DELUXE
A084-91864-C000
M051-00114-C154   Rev. 4

CROSS REFERENCE

DESCRIPTION	QTY.	DESIGNATION	PART NUMBER
2N5305	2	Q1,Q2	0360-00802-0012
74F32	1	U6	0304-00803-0059
74LS05	1	U5	0E47-00803-0002
74LS74	1	U2	0304-00803-0058
AD7533 DAC	1	U8	0304-00803-0055
16 MHZ OSC	1	U1	0304-00804-0008
LM3900	1	U16	0360-00803-0002
MC6821	1	U7	0304-00803-0054
MC68000 G8 CPU	1	U3	
MC7805 REG	1	U17	0360-00803-0050
PAL16L8A-2 SD0OR0	1	U4	0E47-00803-0001
RAM 2K X 8	2	U9,U10	0E47-00803-0003
TDA2002	1	U15	0360-00803-0009
TL7705AC	1	U18	0066-447RX-XXCX
ROM/EPROM	4	U11-U14	SEE ROM/EPROM SHEET
FERRITE BEAD	3	FB1-FB3	0316-00804-0002
10 UH INDUCTOR	2	L1,L2	0360-00804-0031
16 PIN I.C. SOCKET	1	ICS U8	110E-0001-0003
20 PIN I.C. SOCKET	1	ICS U4	110E-0001-0005
28 PIN I.C. SOCKET	6	ICS U9-ICS U14	110E-0001-0010
40 PIN I.C. SOCKET	1	ICS U7	110E-0001-0011
64 PIN I.C. SOCKET	1	ICS U3	110E-0001-0016
HEATSINK TO-220	1	HS U15	112E-0001-0011
HEATSINK TO-220	1	HS U17	0E47-00804-0001
SIL PAD THERMAL WASHER	2	INS U15, INS U17	0017-00042-0319
SCREW, 6-32	1	MH U15	0017-00101-0339
NUT, 6-32	1	MH U15	0017-00103-0005
WASHER, #6 STAR	1	MH U15	0017-00104-0009
SCREW, 4-40	1	MH U17	0017-00101-0731
NUT, 4-40	1	MH U17	0017-00103-0002
WASHER, #4 STAR	1	MH U17	0017-00104-0071
AUTO INSERT PIN TIN .045 SQ.	16	J1,J2	0304-00804-0010
JUMPER WIPE	12	JW1-JW12	117E-0001-0003
GREEN LED	1	LED 1	119E-00001-0001
TEST POINT	2	TP1,TP2	0017-00007-0131
PC MTG. SWITCH	1	SW1	0986-00804-3100
PC BOARD	1	--	A080-91864-C000
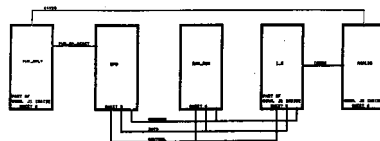
8/01/86 Rev. 1 - Changed Filter Values, C13,C15,C16,C18,C19,R39 CMM
8/05/86 Rev. 2 - Removed D1 CMM.
8/11/86 Rev. 3 - Added CP11-CP13 CMM.
8/15/86 Rev. 4 - Added ICS U13, ICS U14. Fixed Desig. 1ist U5, U6.
          Corrected qty. of Ferrite Bead.

DUAL DISPLY MODULE

A080-91851-E000

TP2 GND

TP1 50VDC
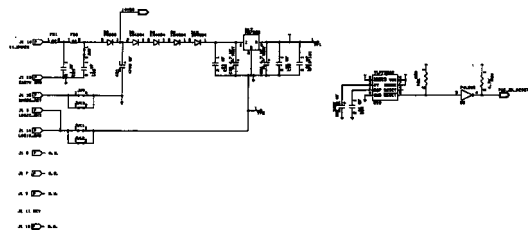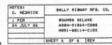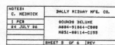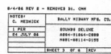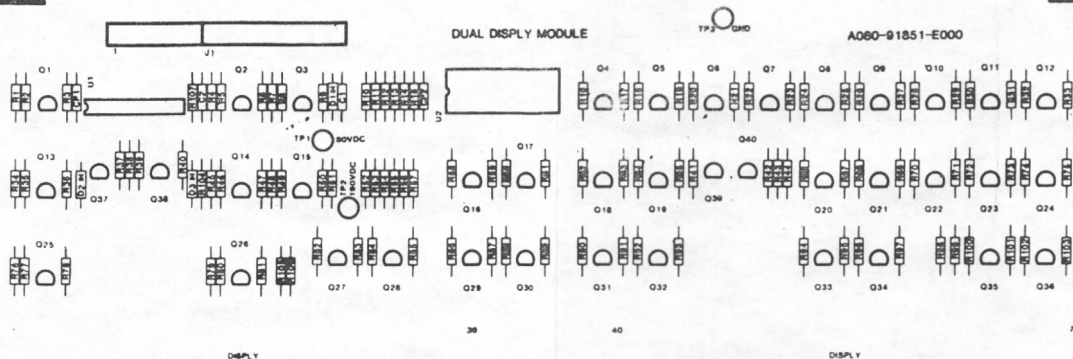
DISPLY

DISPLY

PAT. PENDING

DIM. TOLERANCES				
UNLESS OTHERWISE SPEC.	FIRST USED ON		THIS DWG. IS CONFIDENTIAL & PROPERTY OF BALLY/MIDWAY MFG. CO	
CONCENTRICITY T.I.R. .002	DRN CL	DATE 04/08/86	SCALE	*Bally*/MIDWAY MFG. CO.
FRACTIONAL .... ± 1/64	MECH CHK	MAT'L		FRANKLIN PARK, IL 60131
DECIMAL .... ± .005				ASSY DRAWING
HOLE DIA. ..... + .002 — .000	ELEC CHK	FINISH		DUAL DISPLAY MODULE
ANGLE .... ± 1/2°				A084-91851-E000
DO NOT SCALE DWG.				

REVISIONS

PART NO.
M0·5·1-0·0·3·6·5-E·0·3·3

DESIGNATION LIST

DESIGNATION NO.	DESCRIPTION
R1	1.5K 1/4W 5% CARBON
R2	820 OHM 1/4W 5% CARBON
R3	300K 1/4W 5% CARBON
R4	1.5K 1/4W 5% CARBON
R5	510 OHM 1/4W 5% CARBON
R6	300K 1/4W 5% CARBON
R7	1.5K 1/4W 5% CARBON
R8	820 OHM 1/4W 5% CARBON
R9	300K 1/4W 5% CARBON
R10 - R15	20K 1/4W 5% CARBON
R16	9.1K 1/4W 5% CARBON
R17	100K 1/4W 5% METAL FILM
R18	2.2K 1/4W 5% CARBON
R19	300K 1/4W 5% CARBON
R20	9.1K 1/4W 5% CARBON
R21	100K 1/4W 5% METAL FILM
R22	2.2K 1/4W 5% CARBON
R23	300K 1/4W 5% CARBON
R24	9.1K 1/4W 5% CARBON
R25	100K 1/4W 5% METAL FILM
R26	2.2K 1/4W 5% CARBON
R27	300K 1/4W 5% CARBON
R28	9.1K 1/4W 5% CARBON
R29	100K 1/4W 5% METAL FILM
R30	9.1K 1/4W 5% CARBON
R31	100K 1/4W 5% METAL FILM
R32	9.1K 1/4W 5% CARBON
R33	100K 1/4W 5% METAL FILM
R34	1.5K 1/4W 5% CARBON
R35	820 OHM 1/4W 5% CARBON
R36	300K 1/4W 5% CARBON
R37	300K 1/4W 5% CARBON
R38	1.5K 1/4W 5% CARBON
R39	1K 1/4W 5% CARBON
R40	100K 1/4W 5% CARBON
R41	100K 1/4W 5% CARBON
R42	1K 1/4W 5% CARBON
R43	1.5K 1/4W 5% CARBON
R44	300K 1/4W 5% CARBON
R45	1.5K 1/4W 5% CARBON
R46	820 OHM 1/4W 5% CARBON
R47	300K 1/4W 5% CARBON
R48	1.5K 1/4W 5% CARBON
R49	820 OHM 1/4W 5% CARBON
R50	300K 1/4W 5% CARBON
R51	100K 1/4W 5% METAL FILM
R52 - R57	2.2M 1/4W 5% CARBON
R58	9.1K 1/4W 5% CARBON

DESIGNATION LIST

DESIGNATION NO.	DESCRIPTION
R59	100K 1/4W 5% METAL FILM
R60	100K 1/4W 5% METAL FILM
R61	9.1K 1/4W 5% CARBON
R62	9.1K 1/4W 5% CARBON
R63	100K 1/4W 5% METAL FILM
R64	9.1K 1/4W 5% CARBON
R65	100K 1/4W 5% METAL FILM
R66	9.1K 1/4W 5% CARBON
R67	100K 1/4W 5% METAL FILM
R68	9.1K 1/4W 5% CARBON
R69	100K 1/4W 5% METAL FILM
R70	300K 1/4W 5% CARBON
R71	2.2K 1/4W 5% CARBON
R72	300K 1/4W 5% CARBON
R73	2.2K 1/4W 5% CARBON
R74	300K 1/4W 5% CARBON
R75	2.2K 1/4W 5% CARBON
R76	1.5K 1/4W 5% CARBON
R77	820 OHM 1/4W 5% CARBON
R78	300K 1/4W 5% CARBON
R79	1.5K 1/4W 5% CARBON
R80	820 OHM 1/4W 5% CARBON
R81	300K 1/4W 5% CARBON
R82	300K 1/4W 5% CARBON
R83	2.2K 1/4W 5% CARBON
R84	100K 1/4W 5% METAL FILM
R85	9.1K 1/4W 5% CARBON
R86	300K 1/4W 5% CARBON
R87	2.2K 1/4W 5% CARBON
R88	2.2K 1/4W 5% CARBON
R89	300K 1/4W 5% CARBON
R90	300K 1/4W 5% CARBON
R91	2.2K 1/4W 5% CARBON
R92	300K 1/4W 5% CARBON
R93	2.2K 1/4W 5% CARBON
R94	300K 1/4W 5% CARBON
R95	2.2K 1/4W 5% CARBON
R96	300K 1/4W 5% CARBON
R97	2.2K 1/4W 5% CARBON
R98	10M 1/4W 5% CARBON
R99	1M 1/4W 5% CARBON
R100	300K 1/4W 5% CARBON
R101	2.2K 1/4W 5% CARBON
R102	100K 1/4W 5% METAL FILM
R103	9.1K 1/4W 5% CARBON
R104	150K 1/4W 5% CARBON
R105	10M 1/4W 5% CARBON
R106	1M 1/4W 5% CARBON
R107	10K 1/4W 5% CARBON

DESIGNATION LIST

DESIGNATION NO.	DESCRIPTION
C1	.1UF 500V CER.
C2	100PF 50V AX. CER.
CP1, CP2	.01UF 50V CER.
D1	1M110ZS10 110V ZENER DIODE
D2,D3	1N4148 DIODE
Q1 - Q4	MPS-A-42 NPN XSTR
Q5	2N5401 PNP XSTR
Q6	MPS-A-42
Q7	2N5401
Q8	MPS-A-42
Q9	2N5401
Q10 - Q21	MPS-A-42
Q22 - Q24	2N5401
Q25	MPS-A-42
Q26	MPS-A-42
Q27	2N5401
Q28	MPS-A-42
Q29 - Q35	2N5401
Q36 - Q40	MPS-A-42
U1	74HC373 CMOS OCTAL LATCH
U2	14514 1-16 DECODER
DISPLAY 1	14 DIGIT, 9 SEGMENT GAS DISCHARGE DISPLAY
J1	.025 SQ. PINS
TP1, TP2, TP3	TEST LOOPS
	FOAM TAPE
	BUMPER
A080-91851-E000	DUAL DISPLAY MODULE P.C.B.

CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
510 OHM 1/4W 5% CARBON	1	R5	100E-00005-0053
820 OHM 1/4W 5% CARBON	7	R2,R8,R35,R46 R49,R77,R80	100E-00005-0058
1K 1/4W 5% CARBON	2	R39,R42	100E-00005-0061
1.5K 1/4W 5% CARBON	10	R1,R4,R7,R34,R38 R43,R45,R48 R76,R79	100E-00005-0065
2.2K 1/4W 5% CARBON	14	R18,R22,R26,R71 R73,R75,R83,R87 R88,R91,R93,R95 R97,R101	100E-00005-0069
9.1K 1/4W 5% CARBON	14	R16,R20,R24,R28 R30,R32,R58,R61 R62,R64,R66,R68 R85,R103	100E-00005-0087
10K 1/4W 5% CARBON	1	R107	100E-00005-0088
20K 1/4W 5% CARBON	6	R10 - R15	100E-00005-0095
100K 1/4W 5% CARBON	2	R40,R41	100E-00005-0115
100K 1/4W 5% METAL FILM	15	R17,R21,R25,R29 R31,R33,R51,R59 R60,R63,R65,R67 R69,R84,R102	100E-00001-0011
150K 1/4W 5% CARBON	1	R104	100E-00005-0120
300K 1/4W 5% CARBON	24	R3,R6,R9,R19,R23 R27,R36,R37,R44, R47,R50,R70,R72, R74,R78,R81,R82, R86,R89,R90,R92, R94,R96,R100	100E-00005-0127
1.0M OHM 1/4W 5% CARBON	2	R99,R106	100E-00005-0140
2.2M OHM 1/4W 5% CARBON	6	R52 - R57	100E-00005-0147
10.0M OHM 1/4W 5% CARBON	2	R98,R105	100E-00005-0162
100PF AX. CER.	1	C2	0639-00800-0003
.01UF	2	CP1,CP2	0360-00800-0005
.01UF 500V	1	C1	0360-00800-0013
1N4148	2	D2,D3	103E-00002-0005
1M110ZS10 110V ZENER DIODE	1	D1	103E-00001-0028
2N5401 PNP XSTR	14	Q5,Q7,Q9,Q22,Q23 Q24,Q27,Q29,Q30 Q31,Q32,Q33,Q34 Q35	0360-00802-0006
MPS-A-42 NPN XSTR	26	Q1-Q4,Q6,Q8,Q10- Q21,Q25,Q26,Q28 Q36-Q40	0360-00802-0007
14514 1-16 DECODER	1	U2	0360-00803-0013
74HC373 OCTAL LATCH	1	U1	0365-00803-0015
.025SQ. PINS	23	J1	0304-00804-0009
14 DIGIT, 9 SEGMENT GAS DISCHARGE DISPLAY	1	DISPLAY 1	119E-00002-0006
TEST LOOPS	3	TP1 - TP3	0017-00007-0131
FOAM TAPE	3		0017-00081-0288
BUMPER	1		0017-00041-0598
DUAL DISPLAY MODULE PCB	1		A080-91851-E000

BALLY MIDWAY MFG. CO.

NOTES:
R. KOHAN

DUAL DISPLAY MODULE
A084-91851-E000
A851-88365-E834

SHEET 1 OF 2   REV E

9 SEGMENT 14 DIGIT DISPLAY
FRONT SIDE PIN OUT

BALLY MIDWAY MFG. CO.

NOTES:
R. KOHAN

DUAL DISPLAY MODULE
A084-91851-E000
A851-88365-E834

SHEET 2 OF 2   REV E

6803 CONTROL BD

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PAT. PENDING

A080-91786-G000

X-TAL1

BATT1

J9 J8 J7 J6

15 PLAYFIELD SWITCH 1   15 CABINET SWITCH 1   19   DISPLAY   1   15   J5   1
J4   J3   J2

TP1 TP2 TP3 TP4 TP5 TP6 TP7
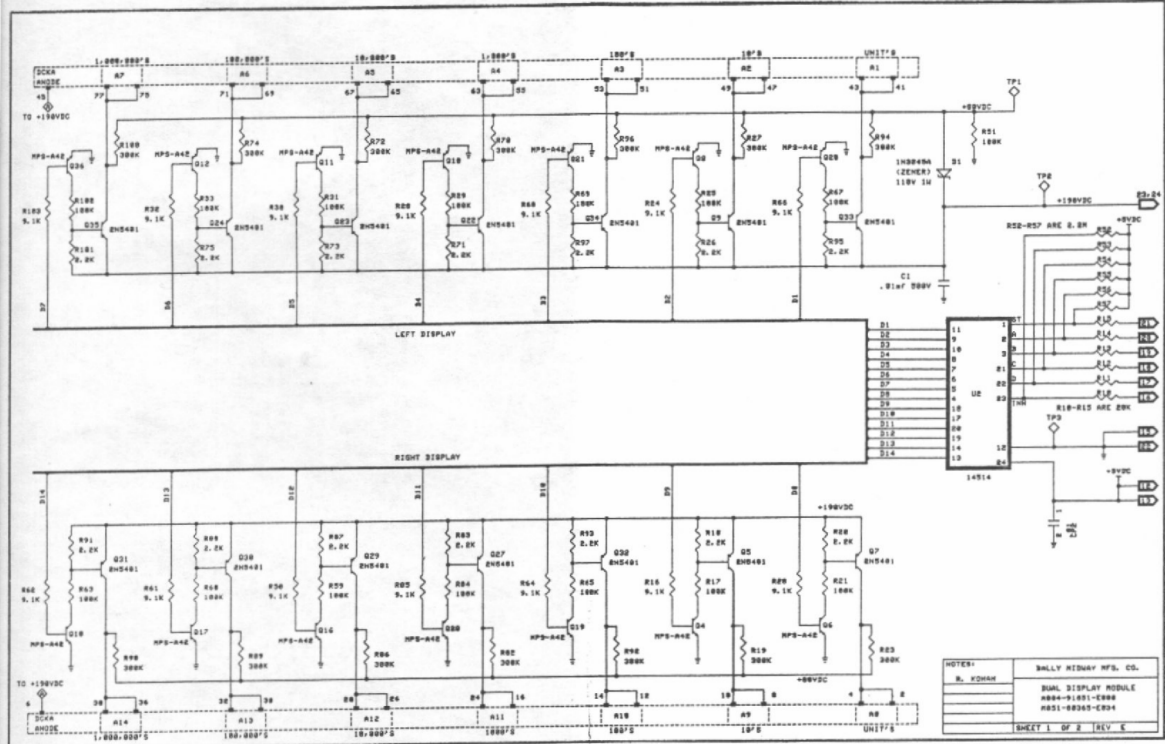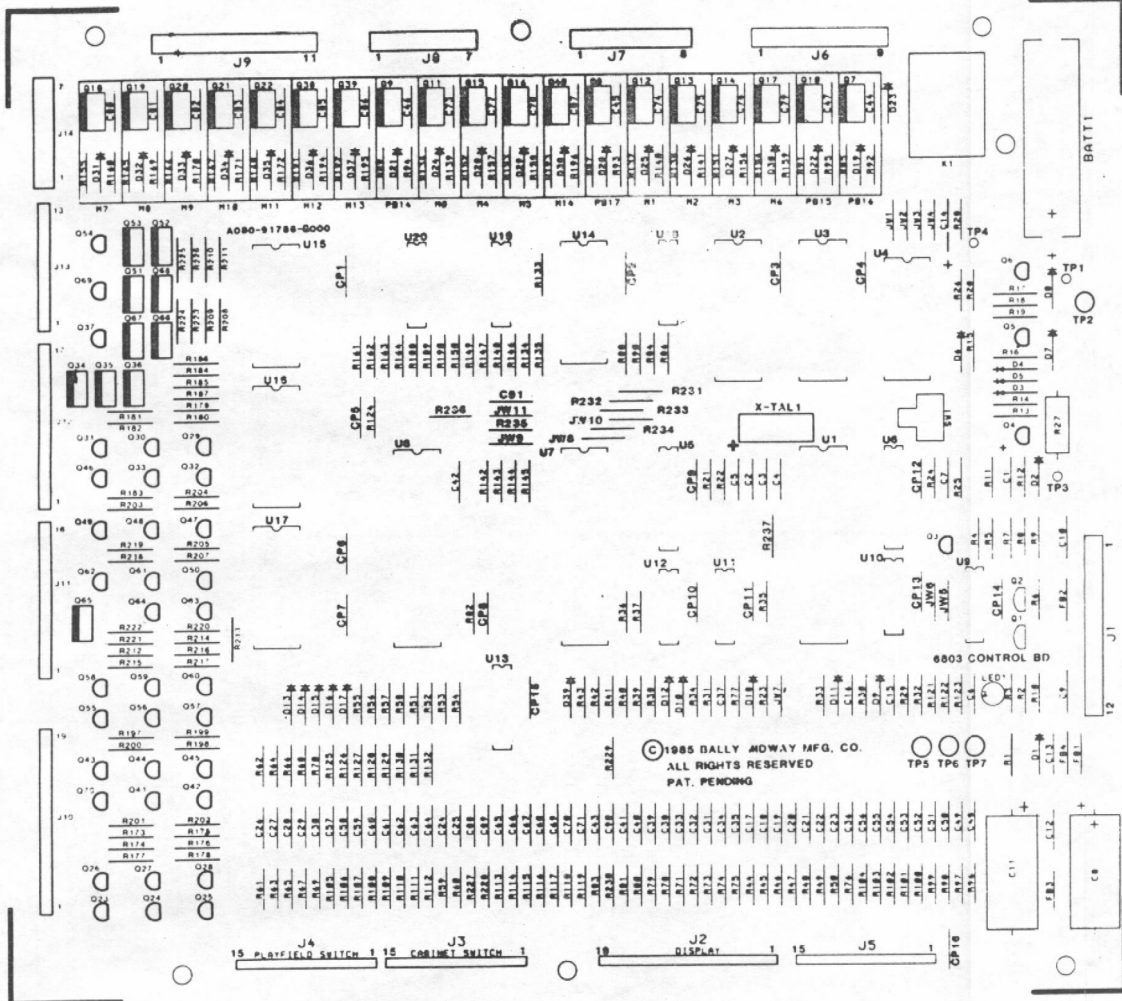
DIM. TOLERANCES	FIRST USED ON				MIDWAY MFG. CO.	
UNLESS OTHERWISE SPEC. CONCENTRICITY T.I.R. .002	DRN CL	DATE 04/08/86	SCALE		FRANKLIN PK., IL. 60131 A BALLY CO	
FRACTIONAL ...... ± 1/64 DECIMAL .... ± .005 HOLE DIA. ..... + .002−.000 ANGLE .... ± 1/2°	MECH CHK	MAT L		ASSY DRAWING 6803 CONTROL BD. A084−91786−G000		REVISIONS
DO NOT SCALE DWG.	ELEC CHK	FINISH			PART NO	M·0·5·1−0·0·C·5·3−G·0·0·3

CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
27pf 50V CER.	2	C2, C3	0360-00800-0052
47pf 50V CER.	1	C7	0360-00800-0027
390pf 50V CER.	25	C24-C30, C57-C71 C88-C90	0360-00800-0001
470pf 1KV CER.	27	C17-C23, C31-C36, C38-C41, C48-C56, C91	0307-00800-0008
.002uf 1KV CER.	19	C44-C47, C73-C87	0360-00800-0012
.003uf 1KV CER.	1	C43	0360-00800-0025
.01uf 50V CER.	24	C6, C9, C10, C12, C13 C15, C16, C42, CP1-CP16	0365-00800-0014
.05uf 16V CER.	1	C37	0360-00800-0006
.1uf 50V CER.	1	C4	0360-00800-0058
4.7uf 25V TANT	2	C5, C14	0360-00800-0008
6.8uf 25V TANT	1	C1	0360-00800-0048
470uf 16V ELEC	1	C8	0360-00800-0022
470uf 25V ELEC	1	C11	0360-00800-0024
82 OHM 1/4W 5%	1	R9	100E-00005-0031
100 OHM 1/4W 5%	1	R8	100E-00005-0033
110 OHM 1/4W 5%	1	R83	100E-00005-0034
120 OHM 1/4W 5%	21	R24, R85, R87, R89, R91, P121, R136-R138, R151-R155, R165-R168, R191-R193	100E-00005-0035
270 OHM 1/4W 5%	1	R28	100E-00005-0044
330 OHM 1/4W 5%	23	R92-R95, R139-R141, R156-R160, R169-R172, R194-R196, R231-R234	100E-00005-0047
470 OHM 1/4W 5%	9	R96-R104	100E-00005-0051
560 OHM 1/4W 5%	1	R1	100E-00005-0054
680 OHM 1/4W 5%	1	R25	100E-00005-0056
750 OHM 1/4W 5%	1	R19	100E-00005-0057
910 OHM 1/4W 5%	1	R18	100E-00005-0059
1K 1/4W 5%	3	R3, R29, R32	100E-00005-0061
1.2K 1/4W 5%	60	R44-R50, R59-R61, R63, R65, R67, R69, R71-R76 R78-R82, R105-R119, R122 R133-R135, R146-R150, R161-R164, R188-R190, R227, R228, R230, R236	100E-00005-0063
1.5K 1/4W 5%	1	R20	100E-00005-0065
2K 1/4W 5%	46	R123, R173-R187 R197-R226	100E-00005-0068
2.7K 1/4W 5%	2	R2, R6	100E-00005-0071
3K 1/4W 5%	1	R17	100E-00005-0073
3.3K 1/4W 5%	18	R21-R23, R35, R51-R58, R124, R142-R145, R235	100E-00005-0074
3.9K 1/4W 5%	4	R84, R86, R88, R90	100E-00005-0077
4.7K 1/4W 5%	8	R36-R43	100E-00005-0079
5.6 1/4W 5%	1	R16	100E-00005-0082

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
7.5 1/4W 5%	1	R5	100E-00005-0085
9.1 1/4W 5%	1	R4	100E-00005-0087
10K 1/4W 5%	4	R12, R13, R30, R33	100E-00005-0088
15K 1/4W 5%	2	R31, R34	100E-00005-0092
39K 1/4W 5%	1	R7	100E-00005-0102
47K 1/4W 5%	2	R10, R11	100E-00005-0104
56K 1/4W 5%	14	R62, R64, R66, R68 R70, R125-R132, R229	100E-00005-0106
62K 1/4W 5%	1	R15	100E-00005-0107
82K 1/4W 5%	1	R14	100E-00005-0112
100K 1/4W 5%	2	R26, R237	100E-00005-0115
270K 1/4W 5%	1	R77	100E-00005-0126
82 OHM 1W 10%	1	R27	100E-00007-0014
1N958A ZENER	1	D1	103E-00001-0002
1N4004	20	D19-D38	103E-00003-0005
1N4148	13	D3, D6, D9-D18, D39	103E-00002-0005
1N4606	5	D2, D4, D5, D7, D8	103E-00002-0006
2N3904	3	Q2, Q4, Q6	104E-00004-0006
2N4403	2	Q3, Q5	104E-00002-0006
2N5060	35	Q23-Q33, Q37, Q41-Q50, Q54-Q64, Q69, Q70	104E-00015-0001
2N5305	1	Q1	104E-00007-0003
MCR106-1	10	Q34-Q36, Q51-Q53, Q65-Q68	0360-00802-0009
SE9302	19	Q7-Q22, Q38-Q40	0360-00802-0008
4011	1	U11	0360-00803-0010
4502	1	U13	0360-00803-0005
4514B	3	U15-U17	0360-00803-0013
4584	1	U12	0066-090BX-XXDX
6116 RAM	1	U4	0365-00803-0013
6803 MPU	1	U1	0360-00803-0048
6821 PIA	2	U7, U8	0360-00803-0017
74LS04	1	U10	0A15-00803-0010
74LS10	1	U9	0A89-00803-0007
75LS154	1	U14	0360-00803-0024
74HCT245	1	U5	0365-00803-0014
74LS373	1	U6	0A89-00803-0006
CA3081	3	U18-U20	0360-00803-0009
3.580 MHz CRYSTAL	1	XTAL-1	109E-00001-0003
LED GREEN	1	LED 1	0017-00007-0131
TEST POINTS	7	TP1-TP7	0017-00007-0131
SWITCH P.B.	1	SW1	0017-00032-0038
BATTERY 3.6V	1	BATT-1	0003-00043-0172
ZERO OHM RES. JUMPER	5	JW2, JW4, JW6, JW8, JW10	117E-00001-0001
RELAY 48VDC	1	K1	114E-00001-0011
40 PIN I.C. SOCKET	3	XU1, XU7, XU8	110E-00001-0011
28 PIN I.C. SOCKET	2	XU2, XU3	110E-00001-0010
24 PIN I.C. SOCKET	1	XU4	110E-00001-0007
FERRITE BEAD	4	FR1-FR4	0316-00804-0002

DESIGNATION LIST

DESIGNATION	DESCRIPTION
C1	6.8UF 25V TANT.
C2,C3	27PF 50V CER.
C4	.1UF 50V CER.
C5	4.7UF 25V TANT.
C6	.01UF 50V CER.
C7	47PF 50V CER.
C8	470UF 16V ELEC.
C9,C10	.01UF 50V CER.
C11	470UF 25V ELEC.
C12,C13	.01UF 50V CER.
C14	4.7UF 25V TANT.
C15,C16	.01UF 50V CER.
C17 - C23	470PF 1KV CER.
C24 - C30	390PF 50V CER.
C31 - C36	470PF 1KV CER.
C37	.05UF 16V CER.
C38 - C41	470PF 1KV CER.
C42	.01UF 50V CER.
C43	.003UF 1KV CER.
C44 - C47	.002UF 1KV CER.
C48 - C56	470PF 1KV CER.
C57 - C71	390PF 50V CER.
C73 - C87	.002 1KV CER.
C88 - C90	390PF 50V CER.
C91	470PF 1KV CER.
CP1 - CP16	.01 50V CER.
R1	560 OHM 1/4W 5%
R2	2.7K 1/4W 5%
R3	1K 1/4W 5%
R4	9.1K 1/4W 5%
R5	7.5K 1/4W 5%
R6	2.7K 1/4W 5%
R7	39K 1/4W 5%
R8	100 OHM 1/4W 5%
R9	82 OHM 1/4W 5%
R10,R11	47K 1/4W 5%
R12,R13	10K 1/4W 5%
R14	82K 1/4W 5%
R15	62K 1/4W 5%
R16	5.6K 1/4W 5%
R17	3K 1/4W 5%
R18	910 OHM 1/4W 5%
R19	750 OHM 1/4W 5%
R20	1.5K 1/4W 5%
R21 - R23	3.3K 1/4W 5%
R24	120 OHM 1/4W 5%
R25	680 OHM 1/4W 5%
R26	100K 1/4W 5%
R27	82 OHM 1W 10%
R28	270 OHM 1/4W 5%
R29	1K 1/4W 5%
R30	10K 1/4W 5%
R31	15K 1/4W 5%
R32	1K 1/4W 5%
R33	10K 1/4W 5%
R34	15K 1/4W 5%
R35	3.3K 1/4W 5%
R36 - R43	4.7K 1/4W 5%
R44 - R50	1.2K 1/4W 5%
R51 - R58	3.3K 1/4W 5%
R59 - R61	1.2K 1/4W 5%
R62	56K 1/4W 5%
R63	1.2K 1/4W 5%
R64	56K 1/4W 5%
R65	1.2K 1/4W 5%
R66	56K 1/4W 5%
R67	1.2K 1/4W 5%
R68	56K 1/4W 5%
R69	1.2K 1/4W 5%
R70	56K 1/4W 5%
R71 - R76	1.2K 1/4W 5%
R77	270K 1/4W 5%
R78 - R82	1.2K 1/4W 5%
R83	110 OHM 1/4W 5%
R84	3.9K 1/4W 5%
R85	120 OHM 1/4W 5%
R86	3.9K 1/4W 5%
R87	120 OHM 1/4W 5%
R88	3.9K 1/4W 5%
R89	120 OHM 1/4W 5%
R90	3.9K 1/4W 5%
R91	120 OHM 1/4W 5%
R92 - R95	330 OHM 1/4W 5%
R96 - R104	470 OHM 1/4W 5%
R105 - R119	1.2K 1/4W 5%
R121	120 OHM 1/4W 5%
R122	1.2K 1/4W 5%
R123	2K 1/4W 5%
R124	3.3K 1/4W 5%
R125 - R132	56K 1/4W 5%
R133 - R135	1.2K 1/4W 5%
R136 - R138	120 OHM 1/4W 5%
R139 - R141	330 OHM 1/4W 5%
R142 - R145	3.3K 1/4W 5%
R146 - R150	1.2K 1/4W 5%
R151 - R155	120 OHM 1/4W 5%
R156 - R160	330 OHM 1/4W 5%
R161 - R164	1.2K 1/4W 5%
R165 - R168	120 OHM 1/4W 5%
R169 - R172	330 OHM 1/4W 5%
R173 - R187	2K 1/4W 5%
R188 - R190	1.2K 1/4W 5%
R191 - R193	120 OHM 1/4W 5%
R194 - R196	330 OHM 1/4W 5%
R197 - R226	2K 1/4W 5%
R227,R228	1.2K 1/4W 5%
R229	56K 1/4W 5%
R230	1.2K 1/4W 5%
R231 - R234	330 OHM 1/4W 5%
R235	3.3K 1/4W 5%
R236	1.2K 1/4W 5%
R237	100K 1/4W 5%
D1	1N958B
D2	1N4606
D3	1N4148
D4,D5	1N4606
D6	1N4148
D7,D8	1N4606
D9 - D18	1N4148
D19 - D38	1N4004
D39	1N4148
Q1	2N5305
Q2	2N3904
Q3	2N4403
Q4	2N3904
Q5	2N4403
Q6	2N3904
Q7 - Q22	SE9302
Q23 - Q33	2N5060
Q34 - Q36	MCR 106-1
Q37	2N5060
Q38 - Q40	SE9302
Q41 - Q50	2N5060
Q51 - Q53	MCR 106-1
Q54 - Q64	2N5060
Q65 - Q68	MCR 106-1
Q69,Q70	2N5060
U1	6803
U4	6116 RAM
U5	74HCT245
U6	74LS373
U7,U8	6821
U9	74LS10
U10	74LS04
U11	4011
U12	4584
U13	4502
U14	74LS154
U15 - U17	4514B
U18 - U20	CA3081
XTAL-1	3.580 MHZ CRYSTAL
LED 1	LED GREEN
TP1 - TP7	TEST POINTS
SW1	SWITCH P.B.
BATT-1	BATTERY 3.6V
JW2	ZERO OHM RES. JUMPER
JW4	ZERO OHM RES. JUMPER
JW6	ZERO OHM RES. JUMPER
JW8	ZERO OHM RES. JUMPER
JW10	ZERO OHM RES. JUMPER
K1	RELAY 48V DC
XU1,XU7,XU8	40 PIN IC SOCKET
XU2,XU3	28 PIN IC SOCKET
XU4	24 PIN IC SOCKET
FB1 - FB4	FERRITE BEAD
J1	11 - .045 SQ. PINS
J2	18 - .025 SQ. PINS
J3	14 - .025 SQ. PINS
J4	14 - .025 SQ. PINS
J5	14 - .025 SQ. PINS
J6	8 - .045 SQ. PINS
J7	7 - .045 SQ. PINS
J8	6 - .045 SQ. PINS
J9	10 - .045 SQ. PINS
J10	18 - .025 SQ. PINS
J11	17 - .025 SQ. PINS
J12	16 - .025 SQ. PINS
J13	12 - .025 SQ. PINS
J14	5 - .045 SQ. PINS
P/O BATT-1	TY-WRAP
6803 CONTROL BD.	P.C. BOARD

CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
.025 SO. PINS	123	J2, J3, J4, J5, J10, J11, J12, J13	0304-00804-0009
.045 SO. PINS	47	J1, J6, J7, J8, J9, J14	0304-00804-0010
TY-WRAP	1	P/O BATT-1	0017-00042-0622
P.C. BOARD	1	6803 CONTROL BOARD	A080-91786-G000

4-23-86 REV. 1.0 Fixed Part Number for 470PF Cap.

Bally Midway MFG. CO.
6803 PINBALL CONTROL MODULE
SCHEMATIC DRAWING
A084-91766-8800
A084-91766-8800
A021-90233-8804
SHEET 1 OF 7 INCL

Special Forces schematic diagrams — Bally Midway MFG. Co.

LAMP DRIVER LOCATIONS

DRIVER	CONNECTOR	PIN	PHASE	WIRE	DESCRIPTION
045	J10	10	A	28	BOMB "8"
046	J11	16	A	78	BOMB "8"
029	J11	8	A	64	BOMB "M"
060	J10	13	A	36	BOMB "O"
031	J11	13	B	73	BOMB LOAD "1"
048	J11	10	B	68	BOMB LOAD "2"
063	J11	3	B	59	BOMB LOAD "3"
057	J10	18	A	43	BOMBS "1"
026	J10	4	A	15	BOMBS "2"
043	J10	11	A	31	BOMBS "4"
058	J10	19	A	45	BOMBS "8"
023	J10	1	B	12	BONUS "1"
070	J10	7	B	24	BONUS "2"
059	J10	16	B	38	BONUS "4"
024	J10	2	B	13	BONUS "8"
042	J10	9	B	26	BONUS "X"
041	J10	8	B	25	BONUS "16"
061	J11	6	A	62	BONUS "2X"
056	J10	17	A	41	BONUS "32"
030	J11	12	A	72	BONUS "3X"
047	J11	11	A	71	BONUS "4X"
062	J11	4	A	61	BONUS "5X"
053	J13	12	A	96	BUMPER LEFT
037	J13	4	A	85	BUMPER MIDDLE
068	J13	10	A	94	BUMPER RIGHT
054	J13	11	A	95	COLLECT BONUS
032	J11	14	B	74	ESCAPE
025	J10	3	A	14	EXPANDER BOARD
025	J10	3	B	14	EXPANDER BOARD
069	J11	1	A	48	FIRE BOTTOM LEFT
031	J11	15	A	73	FIRE BOTTOM RIGHT
036	J13	3	A	84	FIRE TOP LEFT
050	J11	7	A	63	FIRE TOP RIGHT
065	J11	1	B	48	G1 #1
034	J13	1	B	81	G1 #2
051	J11	8	B	93	G1 #3
066	J13	6	B	87	G1 #4
035	J13	2	B	81	G1 #5
052	J13	13	B	97	G1 #6
067	J13	5	B	86	G1 #7
036	J13	3	B	84	G1 #8
053	J13	12	B	96	G1 #9
068	J13	10	B	94	G1 #10

LAMP DRIVER LOCATIONS

DRIVER	CONNECTOR	PIN	PHASE	WIRE	DESCRIPTION
037	J13	4	B	85	G1 #11
054	J13	11	B	95	G1 #12
056	J10	17	B	41	HOSTAGE LEFT
041	J10	8	A	25	HOSTAGE RIGHT
034	J13	1	A	81	L1
051	J13	8	A	93	L2
066	J13	6	A	87	L3
035	J13	2	A	83	L4
052	J13	13	A	97	L5
067	J13	5	A	86	L6
044	J10	12	B	32	LEFT BONUS X
028	J10	6	B	21	LEFT RELEASE HOSTAGE
059	J10	14	B	37	LEFT XBALL
049	J11	9	B	67	LOAD BOMB
048	J11	10	A	68	R1
063	J11	3	A	59	R2
032	J11	14	A	74	R3
049	J11	9	A	67	R4
027	J10	5	B	18	RELEASE HOSTAGE
057	J10	18	B	43	ROAD 10,000
026	J10	4	B	15	ROAD 20,000
043	J10	11	B	31	ROAD 40,000
029	J11	8	B	64	ROCKET "C"
061	J11	6	B	62	ROCKET "E"
046	J11	16	B	78	ROCKET "K"
060	J10	13	B	36	ROCKET "O"
045	J10	10	B	28	ROCKET "R"
030	J11	12	B	72	ROCKET "T"
044	J10	12	A	32	ROCKETS "1"
027	J10	5	A	18	ROCKETS "2"
059	J10	14	A	37	ROCKETS "4"
028	J10	6	A	21	ROCKETS "8"
069	J13	7	A	91	SET EXPLOSIVES
042	J10	9	A	26	SHOOT AGAIN
033	J11	15	B	75	SPECIAL LEFT
050	J11	7	B	63	SPECIAL RIGHT
064	J11	2	A	58	WEAPON LAMP
058	J10	19	B	45	WEAPON BONUS
023	J10	1	A	12	WEAPON 25,000
070	J10	7	A	24	WEAPON 50,000
055	J10	16	A	38	WEAPON 75,000
024	J10	2	A	13	WEAPON 100,000
033	J11	15	A	75	XBALL LAMP

SOLENOID DRIVER LOCATIONS

TRANSISTOR	CONNECTOR PIN	DESCRIPTION	WIRE CODE
Q15	J8-6	BRIGHT 1/INLINE RESET	29
Q17	J6-5	BRIGHT 2/INLINE BOTTOM	36
Q18	J9-1	BRIGHT 3/INLINE MIDDLE	51
Q19	J9-2	BRIGHT 4/INLINE TOP	52
Q20	J9-3	BRIGHT 5/SAUCER	53
Q11	J6-1	BUMPER LEFT	31
Q13	J6-3	BUMPER MIDDLE	34
Q12	J6-2	BUMPER RIGHT	32
Q40	J9-11	KNOCKER/KICKER TO P.F.	59
Q39	J9-8	OUTHOLE/CAPTURE O.T.	58
Q38	J9-7	RESERVED FOR GERMAN	57
Q14	J6-4	SLING LEFT	35
Q16	J7-1	SLING RIGHT	27
Q22	J9-6	WEAPON D.T. DOWN	56
Q21	J9-4	WEAPON D.T. UP	54
Q7	J9-8	* FLIPPERS	90
Q7	J6-9	* FLIPPERS	95

* FLIPPERS CONNECTED THROUGH K1, THE FLIPPER RELAY.

```
WIRE COLOR CODE

1-RED            6-BROWN
2-BLUE           7-ORANGE
3-YELLOW         8-BLACK
4-GREEN          9-GRAY
5-WHITE          0-NO TRACER
J-JUMPER        11-VIOLET

1-FIRST NUMBER-BODY COLOR
2-SECOND NUMBER-TRACER COLOR

EXAMPLE:  50-WHITE
          51-WHITE-RED
```

Special Forces — Backbox wiring schematics (Bally Midway Mfg. Co.)
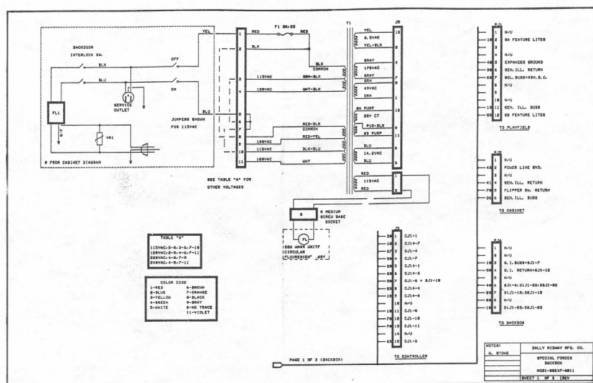
BALLY MIDWAY'S SPECIAL FORCE
#E47
ROM/EPROM PART NUMBERS

UNPROGRAMMED CONTROL BOARD A084-91786-G000
PROGRAMMED CONTROL BOARD A084-91786-AE47

POS.	MIDWAY PART NUMBER
U2	0E47-00803-0004
U3	0E47-00803-0005

JUMPERS	IN	OUT
JW1		**
JW2	**	
JW3		**
JW4	**	
JW5		**
JW6	**	
JW7		**
JW8		**
JW9	**	
JW10	**	
JW11		**

UNPROGRAMMED SOUNDS DELUXE A084-91864-C000
PROGRAMMED SOUNDS DELUXE A084-91864-AE47

POS.	MIDWAY PART NUMBER
U11	0E47-00803-0010
U12	0E47-00803-0011
U13	0E47-00803-0012
U14	0E47-00803-0013

JUMPERS	IN	OUT
JW1	**	
JW2	**	
JW3		**
JW4	**	
JW5		**
JW6		**
JW7	**	
JW8-JW12	**	

M051-00E47-A008	REVISIONS
08-26-86	RELEASE FOR PRODUCTION