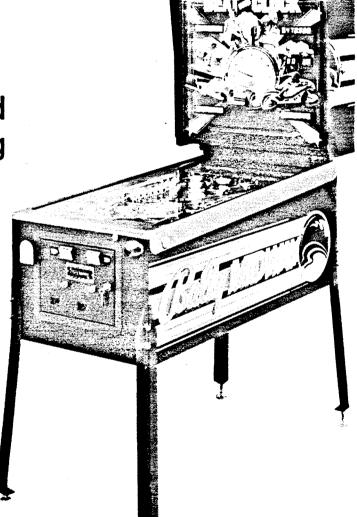
GAME No. 0C70 Form No. 0C70-00300-000

Parts and Operating Manual



Bally MIDWAY MFG.CO.

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#### WARNING

#### THIS GAME MUST BE GROUNDED. FAILURE TO DO SO MAY RESULT IN DESTRUCTION TO ELECTRONIC COMPONENTS.

WARNING: This equipment Generates, Uses and can Radiate Radio Frequency Energy and if not installed and used in accordance with the Instructions Manual, may cause interference to Radio Communications. As temporarily permitted by Regulation it has not been tested for compliance to Subpart J or Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a Residential Area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

ELECTRICAL BULLETIN: FOR ALL APPARATUS COVERED BY THE CANADIAN STANDARDS ASSOCIATION (CSA) STANDARD C22.2 NO. 1, WHICH EMPLOYS A SUPPLY CORD TERMINATED WITH A POLARIZED 2-PRONG ATTACHMENT PLUG.

CAUTION:

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR PREVENIR CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR. UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.



OUR TOLL FREE NUMBER FOR SERVICE INFORMATION CONCERNING THIS GAME, OR ANY OTHER BALLY/MIDWAY™ GAME YOU NOW HAVE ON LOCATION.

> CALL US FOR PROMPT, COURTEOUS ANSWERS TO YOUR PROBLEMS.

Video or Pinball - Continental U.S. 800-323-7182

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## SECTION 1 Installation and General Game Operation Instructions

#### I. INSTALLATION

#### Assemble the game as follows:

Bolt legs to cabinet. Bolt back box to cabinet. Use flat washers under bolt heads. Gently feed cable connectors and ground braid through cable port in back box. Screw ground braid to braid in back box. Carefully and fully insert connectors on printed circuit assemblies.

On all games there are certain items that should be checked after shipment. These are visual inspections which may avoid time consuming service work later. Minor troubles caused by abusive handling in shipment are unavoidable. Cable connectors may be loosened, switches (especially tilt switches) may go out of adjustment. Plumb bob tilt switch should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

- 1. Check that all cable connectors are completely seated on printed circuit assemblies.
- 2. Check that cables are clear of all moving parts.
- 3. Check for any wires that may have become disconnected.
- 4. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
- Check wires on 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 the transformer for any foreign material shorting across wiring lugs.
- 8. Check wiring of transformer to correspond to location voltage. See figure 1.

Check adjustment of the two (normally open) tilt switches:

- Plumb bob tilt on left side of cabinet near front door.
- 2. Ball tilt above plumb bob tilt. Insert the smaller ball (15/16" dia.) into the ball tilt assembly, and adjust the bracket so the ball will roll free to contact the switch blade, if front of cabinet is raised.

### TRANSFORMER CONNECTION INSTRUCTIONS

#### REFER TO BACK BOX WIRING DIAGRAM IN GAME MANUAL FOR TABLE "A"

Figure 1.

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

PART OF POWER TRANSFORMER MODULE LOCATED IN BACK BOX

#### **II. GENERAL GAME OPERATION**

Place ball into playfield by outhole.

Plug in line cord. Move power ON-OFF master switch at bottom right front corner of cabinet to "ON" position. The game will play a power-up tune to announce game-readiness. Drop targets are reset, scores are set to zero, alternating with the "High Score to Date", and the game is ready to play. Coin Game. The game should accept the coin and post credits\* for coins accepted (adjustable). Pressing the credit button on the cabinet will cause the outhole kicker to serve the ball to the shooter alley. A game-up tune\* is played to announce play-readiness.

One player is posted each additional time the credit button is pressed (one to four can play). The credits are reduced by one each time the credit button is pressed until the credits are reduced to zero.

Shooting the ball initiates play.

The game awards all points earned by the player. If 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 player-up on the back box is advanced one position. The outhole kicker serves the ball to the shooter alley and play is resumed. This continues until each player's time units run out(adjustable). At this time 'Game Over' light is lit. A random Match\* number appears and the "Match" light is lit. If the number is the same as the last two digits in a player's score, a free game is awarded.

Scoring over 10,000,000 gives "High Score to Date" award.

At the end of the game, a "High Score to Date" is alternately flashed with all 4 player scores. If the "High Score to Date" is beat, this feature\* awards free games (adjustable, using REGISTER 15 as discussed on page 1-10).

Tilting the game results in loss of a ball and a time penalty of 15 units. 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 after the ball kicker assembly serves the ball to the shooter alley.

Slamming the machine results in loss of the game. All feature lights go out, the game goes "dead", and a time delay occurs. The purpose of the time delay is to discourage unnecessay abuse of the machine. After the delay, the "Game Over" light lights and the power-up tune is played. The time delay occurs anytime one of the slam switches is

made to contact. There are two factory installed slam switches, one on the front door, and one on the left side of the cabinet. (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.

\* Some tunes and features can be disabled or adjusted by operator if so desired. See Standard Game Feature Options on pages 1-9 and 1-10.

NOTE: Scoring and feature units will differ from game to game.

#### III. TAILORING & TESTING THE GAME

#### INTRODUCTION

One of the reasons for developing this new system is to provide more information to the operator. In the past, if a game was performing too liberally an operator could only guess what feature might be affecting his income. Through the process of trial and error a "good businessman" eventually found the problem and either changed score thresholds or flipped switches to get the game to perform in accordance with its location.

The new system introduces a subroutine that gives the operator more feedback on how the awards are being delivered. This subroutine allows the operator to change game features, awards and threshold settings. It also monitors specific specials awarded, game percentage and income.

All of this information is stored in memory locations or REGISTERS located in intergrated circuit U4. This memory remains intact with the game off through the use of a battery. Should erroneous information "sneak into" certain REGISTERS due to a weak battery, a flag is set telling the processor that the information stored is no longer valid. When this occurs, the processor resets these REGISTERS to factory settings, the next time the game is turned on. Also, the high score to date will flash all 5's on the 1st thru 4th player digital displays during the attract mode. In addition, the credit/coin code in REGISTER 17 goes to 01 (1 credit/1 coin for all coin chutes used).

To simplify entry to the REGISTERS and SELF-TEST functions BALLY/MIDWAY has provided a keypad that allows the operator to go directly to the function or register in question. This eliminates the tedious procedure of repeatedly pressing the Self-Test Button to look at a certain REGISTER. It also ends the aggravation of having to open the backbox just to flip switches on the MPU Board.

For example, to look at the TOTAL PLAY REGISTER in the old system, you had to press the test button 11 times! Of course this gave you time to chat with the local Repair Expert and learn how he and Ernie always "put chewin' gum on the legs to keep the game from slidin'." But occasionally, the conversation caused you to pass the REGISTER you were looking for, and you had to start over again.

With the new system, we simply hit the test button once and go to the specific REGISTER by using the keyboard.

If the REGISTER is used for Bookkeeping, (i.e. total coins chute #1) it is protected from change and may only be observed or reset to zero. No fabricated numbers may be introduced.

If the REGISTER is a game feature option (i.e. sound options) it can be changed directly from the keyboard.

#### **OPERATION**

The keyboard is located on the right inside wall of the game near the front door. The cable has been lengthened, so that once the keyboard is removed, it may be easily operated from outside the game.

The first step is to press the black Test Button located on the front door once. This tells the processor to do the following:

- 1. Check to make sure that no switches wired in parallel with the keypad are closed.
- 2. If any of these switches are closed the game automatically jumps to STUCK-SWITCH Test (94 is shown in the Match/Credit Display) and flashes the number of the conflicting switch in all four player displays. By referring to the STUCK-SWITCH I.D. Table on page 1-18, we can pin-point the culprit immediately. When the switch is opened up the stuck-switch test now checks all of the other switches to insure that they're open. A flashing 00 in all four player displays indicates the switches are now open. Pressing the black Test Button should cause the game to exit STUCK-SWITCH Test and go into LAMP Test. (90 in the Match/Credit display) Pressing (KEYBD/CLR) button takes the game out of Lamp Test, displays 00 in the Match/Credit Display and the game is now ready for KEYBOARD ENTRY.
- If there were no stuck switches in parallel with the keyboard, the game enters Keypad Mode and displays 00 in the Match/Credit display. The game is now ready for KEYBOARD ENTRY.

PLEASE NOTE: Some of the buttons on the KEYBOARD are not used but have been provided for future expansion. They are the keys (D), (E), (F), and (\*).

#### **KEYBOARD ENTRY**

If you've reached this point with no problems you should find the rest of the procedure simple. Just press the number(s) of the REGISTER you want to see and press (ENTER). Use the REGISTER Table inside the game for a reference. As you press the number(s), they should appear in the Match/Credit Display. When you operate the (ENTER) button, the current information of the REGISTER will be shown in the Player #1 Display. If this REGISTER is not "protected" by the program, new information may be installed. Just press the numbers you want installed and they appear on the Player #2 Display. This allows you to compare the "old" information with the "new". Now press (ENTER) and both displays show the "new"

information. If you made a mistake, just punch in the correct number so it appears in Player #2 and press (ENTER) again. This inserts the corrected information into the REGISTER and both displays again show the new numbers.

Example: Let's say you want to change the maximum number of credits from 20 to 15. We look up this function in the REGISTER Table and find the feature is located in REGISTER 16. Just press buttons (1), (6), and (ENTER). The Match/Credit Display shows 16 and Player #1 should show a 20. Now press (1 and 5) (15 appears in the Player #2 Display) and (ENTER). The 15 is now also in Player #1 and therefore in the REGISTER.

Suppose you accidentally pressed (1 and 4) instead of (1 and 5) then (ENTER). The number 14 is now in the REGISTER. To correct this, simply press (1 and 5),(ENTER) and the REGISTER now shows a 15.

**NOTE:** If the number you entered is invalid, the game will make a funny noise and send you back to REGISTER 00. (the start)

#### STEPPING THROUGH

Once you have looked at a REGISTER or changed it, you have three options:

- 1.Press (ENTER)...This causes the game to step to the next REGISTER. Example: If you're looking at the information in REGISTER 23 and press (ENTER), the Match/Credit display changes to 24 and the information contained in REGISTER 24 is displayed in the Player #1 position. This means we can single-step through the REGISTERS just pressing the (ENTER) key.
- 2. Press (KEYBRD/CLR)...This puts 00 back in the Match/Credit display allowing us to enter a number of a new REGISTER or FUNCTION we wish to see.
- 3.Press (GAME)...This causes the microprocessor to exit KEYBOARD ENTRY Mode and return to a gameover condition.

#### **TESTING**

To gain entry to the standard tests we follow the same procedure we used to get to the REGISTERS. Just operate the black Test Button on the front door once. If you followed the instructions outlined under OPERATION, you're ready to proceed. If you haven't please READ THEM NOW. The KEYBOARD treats these Test Functions in the same manner.

- (9), (0), (ENTER)....Turns on the LAMP Test Or
- (9), (1), (ENTER)....Turns on the DISPLAY Test Or
- (9), (2), (ENTER)....Turns on the SOLENOID Test
- (9), (3), (ENTER)....Turns on the SOUND Test

To EXIT any of these tests do one of the following:

Press (KEYBRD/CLR) - Same result as step 2) above....or

Press (ENTER) - This steps the game to the next test....or

Press (GAME) - Same results as step 3) above....

The STUCK-SWITCH Test is function 94 and since the KEYBOARD is in parallel to the game switches this test may only be EXITED by operating the RED Test button on the front door.

One Quick Tip: If you don't remember how to EXIT a Test, just turn the game off and then on again. We humans can't be expected to remember everything.

#### **DESCRIPTION OF TESTS**

LAMPS- (Function 90) This causes all of the switched illumination lites to flash on and off repeatedly until the test is EXITED.

**DISPLAYS-** (Function 91) When the game is placed in this test, each display will cycle from 0 thru 9 in all of its digits. While this isn't as fascinating as gazing into an open fireplace it can usually help you localize a problem to a specific display or component.

**SOLENOIDS** - (Function 92) All of the game solenoids energize in sequence as defined by the SOLENOID IDENTIFICATION TABLE on page 1-18. **PLEASE NOTE:** The flipper buttons must be held closed to allow the flippers to pull-in during this test, YOUR COOPERATION IS APPRECIATED.

SOUND - (Function 93) This test allows the Controller Board to talk to the Sound Board. The Sound Board doesn't talk back to the Controller Board, but it should to you. About once a second it will generate a noise (from the Programmer's top 40 favorites) almost guaranteed to drive your location crazy. So please keep the volume low if you intend to stay in this test any length of time.

STUCK-SWITCH - (Function 94) With this test we can pinpoint a troublesome switch quickly by looking at the Displays. If 00 is flashing in the 4 Player Displays - to the computer that means there are no stuck-switches. When a number other than 00 is flashing in these displays, just refer to the STUCK-SWITCH IDENTIFICATION TABLE on page 1-18. This table, along with its associated playfield drawing should allow you to find the switch immediately.

In addition to locating stuck-switches this test is very useful in confirming the validity of a switch. Sometimes when a serviceman is repairing a connector or soldering a bunch of wires he is pressed for time. Using this test and the Table in the book is the easiest and most accurate way of proving he's connected the wires for the '10 Point Rebound' rather than a parallel circuit to the Coin Switch.

#### IV. KEYBOARD GAME ADJUSTMENTS

#### **TEST FUNCTIONS**

FUNCTION#	TEST
93	LAMP TEST DISPLAY TEST SOLENOIDS TEST SOUND TEST STUCK SW. TEST

#### **REGISTER TABLE - STANDARD GAME FEATURE OPTIONS**

REG. #	DESCRIPTION	VALID ENTRY
REG. #  1 2 3 4 5 6 7 8 9 10 11 12 13 14	TOTAL PLAYS TOTAL REPLAYS COIN CHUTES #1 COIN CHUTES #2 COIN CHUTES #3 # TIME HI SCORE BEAT GAME PERCENTAGE GAME TIME (MINUTES) SERVICE METER CREDITS SPCLS AWARDED FROM PANEL THRESHOLD #1 THRESHOLD #2 THRESHOLD #3	0 THRU 5 0 thru 9999999 0 thru 9999999 0 thru 9999999
14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	THRESHOLD #3 HI SCORE MAX CREDITS ALLOWED COINS OPTION COINS OPTION CHUTE #1 COINS OPTION CHUTE #2 COINS OPTION CHUTE #3 COINS FACTOR BONUS CREDITS (NOT USED) SCORING THRESHOLD MODE SPECIAL MODE HISCORE AWARD SOUNDS MODE GERMAN PRIZE METER MATCH OPTION DISPLAY CREDIT FREE GAMES/GAMES ALLOWED	0 thru 99999999 1 THRU 40 0 THRU 9999999 1 THRU 50 1 THRU 50 1 THRU 50 1 THRU 50 0 THRU 50 0 THRU 5 0 THRU 5 0 THRU 3 1 THRU 99999999 1 = YES 1 = YES 1 = UNLIMITED
32 33 34 35	FREE PLAY # OF SPCLS AWARDED FROM THRES. #1 # OF SPCLS AWARDED FROM THRES. #2 # OF SPCLS AWARDED FROM THRES. #3	65=FREE PLAY/ANY OTHER #=COIN OPERATED

#### **REGISTER TABLE - UNIQUE FEATURE OPTIONS**

REG. #	DESCRIPTION	VALID	ENTRY
36	# OF SPCLS AWARDED FROM TOP SAUCER		
37	# OF SPCLS AWARDED FROM DROP TARGETS		
38	# OF SPCLS AWARDED FROM ROLLOVER		
39	# OF SPCLS AWARDED FROM LEFT OUTLANE		
40	# OF SPCLS AWARDED FROM RIGHT OUTLANE		
41	# OF TIME INTERVALS AWARDED		
42	(NOT USED)	3 = 100K	0 = 250K
43	DT SPCL WITH (Steps by 50K) DT VALUES STEP WITH	1 = DTS MADE	0=BACK TGTS MADE
44		7=30K	0=100K
45	MID SAUCER SPCL WITH (Steps	7-30K	0-10010
46	by 10K) RECALL LEFT SAUCER BONUS	1=YES	0=NO
46	ALTERNATE START ROLLOVERS	1=YES	0=NO
47	CLOCK SPEED	7=SLOWEST	0=FASTEST
49	INITIAL GAME TIME UNITS	7=3:00 (Time Units)	
49	(Steps by 15 Time Units)	, 5.55 (	,
50	RECALL MID SAUCER VALUES	1=YES	0=NO
51	ROTATE S-T-O-P LITES	1=YES	0=NO
52	OUTLANE SPECIAL ON	1=WITH TRIPLE	0=AFTER TRIPLE
53	ROLLOVER SPECIAL ON	1=WITH 40K	0=AFTER 40K
54	LEFT SAUCER AWARDS TIME UNITS	1=EVERY TIME	0=EVERY OTHER TIME
55	RETURN LANES ADD	1=10 UNITS	0=5 UNITS
56	CLOCK STARTS AUTOMATIC	1=NO	0=YES
57	POWER LINE FREQUENCY	1=60HZ (Domestic)	
58	GAME OVER ATTRACT SPEECH	1=YES	0=NO
59	NEW BALL ANIMATION	1=YES	0=NO
60	# OF TILT WARNINGS	3=3	0=NO WARNING
61	SLING SHOTS ACTIVE	1=YES	0=NO
62	OPTIONS TO FACTORY SETTING	1=YES	0=NO

M051-00C70-A006

#### A. CREDITS PER COIN ADJUSTMENT

Register tables 17, 18, 19, 20 and 21 have been reserved for setting coin/credit options. Please read the following instructions carefully so that you may take full advantage of these registers.

#### **REGISTER NO. 17 - CREDITS PER COIN MENU**

This register contains a menu of up to 79 preset credit/coin option settings. Each option setting is numbered. Below you will find a sample portion of the main menu.

Say, for example, you want your game to give 1 credit when 2 coins are dropped through any coin chute. First you would look at the menu to see if this setting is included. Once you find it, refer to the left column for the OPTION INDEX. The example menu below includes the setting you're looking for...1 credit for 2 coins. The number listed in the left column is the OPTION INDEX, which in this case is 36. Using the keypad, go to register no. 17 and enter the number 36 into it.

Say for example, you want your game to give 1 credit when 2 coins are dropped through any coin chute. However, this time you want to give the player a bonus credit when he pays for two. In other words, when the player inserts four coins to pay for two credits, he will recieve a bonus credit for a total of three credits. First you would look at the menu to see if this setting is included. Once you find it, refer to the left column for the OPTION INDEX. The example menu below includes the setting you're looking for...1 credit for 2 coins, 3 credits for 4 coins. The number listed in the left column is the OPTION INDEX, which in this case is 37. Using the keypad, go to register #17 and enter the number 37. When register #17 is set to any value other than zero (0), the values in registers #18, #19, #20, and #21 will be ignored.

\*See CUSTOM CREDITS PER COIN OPTIONS for the use of the registers.

OPTION	CREDITS/COINS	CREDITS/COINS	CREDITS/COINS	BONUS
INDEX	CHUTE #1	CHUTE #2	CHUTE #3	CREDIT AT
35	14 / 1 coin	14 / 1 coin	14 / 1 coin	2 credits
36	1 / 2 coins	1 / 2 coins	1 / 2 coins	
37	1 / 2 coins	1 / 2 coins	1 / 2 coins	

#### **CREDITS PER COINS MENU - REGISTER #17**

OPTION	CREDITS/COINS	CREDITS/COINS	CREDITS/COINS	BONUS
INDEX	CHUTE #1	CHUTE #2	CHUTE #3	CREDIT AT
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	1 / 1 coin 2 / 1 coin	1 / 1 coin 2 / 1 coin 2 / 1 coin 3 / 1 coin 4 / 1 coin 5 / 1 coin 1 / 2 coins 1 / 3 coins 1 / 4 coins 1 / 5 coins 2 / 1 coin 1 / 1 coin 3 / 1 coin 4 / 1 coin 5 / 1 coin 1 / 2 coins 1 / 3 coins	1 / 1 coin 2 / 1 coin 2 / 1 coin 3 / 1 coin 4 / 1 coin 5 / 1 coin 1 / 2 coins 1 / 3 coins 1 / 4 coins 1 / 5 coins 2 / 1 coin 1 / 1 coin 3 / 1 coin 4 / 1 coin 5 / 1 coin 1 / 2 coins 1 / 3 coins	2 credits 3 credits 4 credits 5 credits 6 credits 8 credits 10 credits

### CREDITS PER COINS MENU - REGISTER #17 (cont'd)

OPTION	CREDITS/COINS	CREDITS/COINS	CREDITS/COINS	BONUS
INDEX	CHUTE #1	CHUTE #2	CHUTE #3	CREDIT AT
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 57 58 59 60 61 62 63 64 65 66 67 67 77 78 79 79 79 79 79 79 79 79 79 79 79 79 79	2 / 1 coin 2 / 1 coin 3 / 1 coin 4 / 1 coin 5 / 1 coin 6 / 1 coin 8 / 1 coin 9 / 1 coin 12 / 1 coin 14 / 1 coin 1 / 2 coins 1 / 2 coins 3 / 2 coins 1 / 3 coins 1 / 3 coins 1 / 3 coins 1 / 3 coins 2 / 3 coins 1 / 4 coins 1 / 5 coins 2 / 5 coins 1 / 1 coin 1 / 1 coin 0 / 1 coin 1 / 1 coin 1 / 1 coin 0 / 1 coin	1 / 4 coins 1 / 5 coins 3 / 1 coin 4 / 1 coin 5 / 1 coin 6 / 1 coin 7 / 1 coin 8 / 1 coin 9 / 1 coin 12 / 1 coin 14 / 1 coin 1 / 2 coins 1 / 1 coin 2 / 1 coin 3 / 1 coin 4 / 1 coin 5 / 1 coin 1 / 3 coins 1 / 4 coins 3 / 2 coins 1 / 3 coins 2 / 3 coins 1 / 3 coins 1 / 3 coins 1 / 3 coins 1 / 3 coins 2 / 3 coins 2 / 3 coins 2 / 3 coins 2 / 3 coins 1 / 3 coins 2 / 3 coins 2 / 3 coins 2 / 3 coins 4 / 5 coins 3 / 4 coins 3 / 1 coin 1 / 2 coins 4 / 5 coins 0 / 1 coin 1 / 2 coins 4 / 1 coin	1 / 4 coins 1 / 5 coins 3 / 1 coin 4 / 1 coin 5 / 1 coin 6 / 1 coin 8 / 1 coin 9 / 1 coin 12 / 1 coin 14 / 1 coin 1 / 2 coins 1 / 3 coins 1 / 4 coins 1 / 5 coins 3 / 2 coins 1 / 3 coins 2 / 3 coins 1 / 4 coins 3 / 4 coins 1 / 5 coins 6 / 1 coin 3 / 1 coin 7 / 1 coin 1 / 1 coin	2 credits 3 credits 4 credits 5 credits 12 credits 12 credits 10 credits 10 credits 4 credits 5 credits 4 credits 5 credits 10 credits 10 credits 10 credits

#### REGISTERS #18, #19, #20, and #21 -CUSTOM CREDITS PER COIN OPTIONS

These registers are used only when the desired credit/coin setting does not appear on the CREDITS PER COIN MENU (see register #17). Register #17 MUST be set for zero (0) in order to use these four registers. This procedure allows you to set any credit/coin combination manually. Please read the following instructions carefully. Registers #18,#19 and #20 represent the three coin chute options. Each coin chute option may be set to give a different number of credits per coin, or they may be set the same. Register #21 represents the coin factor. All four of these registers work together to deliver virtually any combination desired.

The coin chute options represent the credits awarded at each coin chute and the coin factor represents the coins. Although each coin chute option may be set differently, they must have a common denominator...the coin factor, register #21. To arrive at the common denominator, (the coin factor), you must first decide what you want each coin chute option to be. Let's say, for example, you want coin chute #1 to give 1 credit for 1 coin, coin chute #2 to give 2 credits for 1 coin and coin chute #3 to give 1 credit for 2 coins.

This is how it would look:

#### COIN OPTIONS / COIN FACTOR

COIN CHUTE OPTION #1	1 credit / 1 coin
COIN CHUTE OPTION #2	2 credit / 1 coin
COIN CHUTE OPTION #3	1 credit / 2 coin

The COIN FACTOR must be equal from one Coin Chute to another and above it is not. Therefore you must find a common denominator. In most cases, this will be the largest number. In the illustration above, the largest number under COIN FACTOR is 2 at Coin Chute #3. In order to change the COIN FACTOR in the other two coin chutes to equal 2. we must also change the COIN OPTIONS in those chutes. Since we must double the COIN FACTOR in chute #1 and #2 to equal 2, we must also double the COIN OPTIONS in those coin chutes. Whatever we do to the COIN FACTOR to make it equal to the largest number, we must also do to the COIN OPTION. For example:

#### COIN OPTIONS / COIN FACTOR

COIN CHUTE OPTION #1	1 credit / 1 coin
would become COIN CHUTE OPTION #1	2 credit / 2 coin
and COIN CHUTE OPTION #2	2 credit / 1 coin
would become COIN CHUTE OPTION #2	4 credit / 2 coin

The finished layout would then look like this:

#### COIN OPTIONS/COIN FACTOR

Register #18 = COIN CHUTE OPTION #1 = 2 credit/ 2 coin Register #19 = COIN CHUTE OPTION #2 = 4 credit/ 2 coin Register #20 = COIN CHUTE OPTION #3 = 1 credit/ 2 coin

Register #21 = COMMON COIN FACTOR = 2

As you see, we now have one COIN FACTOR that is common to all three coin chutes...2. We now have what we need to enter the correct values into registers #18, #19, #20, and #21.

> REGISTER #18 = 2 REGISTER #19 = 4 REGISTER #20 = 1 REGISTER #21 = 2

#### **REGISTER NO. 22 - BONUS CREDITS**

This register is used in conjunction with the Custom Coin Option Register #18, #19, # 20, and #21. The number entered in register # 22 determines when a bonus credit will be delivered while purchasing credits.

For example, entering a '4' into register #22 will give the player an extra credit for every 4 credits purchased prior to starting the game. This allows the operator the ability to provide an incentive to the player when the Custom Coin Option Registers are used.

PLEASE NOTE: When register #17 is set to any number other than '0' registers #18 through #22 will be ignored.

#### **INCOME BOOKKEEPING REGISTERS**

Specific registers have been assigned to keep track of coins dropped into the game.

REGISTER #	DISPLAYS
3	Coin Chute #1 (Left)
4	Coin Chute #2 (Center)
5	Coin Chute #3 (Right)

These registers may not be altered, but can be RESET by entering '0'.

One additional meter is provided to record the total number of Service Credits entered. This information is stored in register #9. The Service Credits feature is provided to allow the operator to test the game under normal conditions without altering the Coin Chute or setting the game on free play.

To enter Service Credits simply go to register #10-Current Credits - and enter a number from 1 through 5. **NOTE:** This feature will not allow any credits to be entered if the Current Credits register is displaying 5 or greater. Then press the game button on the keyboard and you're ready to start playing by operating the Credit Button.

## B. STANDARD GAME FEATURE OPTIONS

#### **MAXIMUM CREDITS; REGISTER 16**

The maximum credits accepted by the machine limits the number of games that can be accumulated by coining, by winning replays, or both. The maximum number of credits is selectable by means of setting REGISTER 16. Any number entered between '1' and '40' will set the corresponding credit limit.

#### **MATCH FEATURE: REGISTER 29**

When the Match Feature is ON, a random number appears on the Match/Credit window and the word Match is illuminated. If the number matches the tens digit in a player's score, a free game is awarded. The Match Feature creates an incentive to play.

MATCH	REGISTER 29
ON	1
OFF	0

#### **CREDIT DISPLAY; REGISTER 30**

CREDITS DISPLAYED	REGISTER 30
YES	1
NO	0

#### HIGH SCORE FEATURE; REGISTER 24

The game is designed to award Extra Time Units or a Free game at each of the two or three score levels.

AWARD	REGISTER 24
REPLAY	ENTER '3'
EXTRA TIME UNITS	ENTER '2'
NOVELTY (POINTS)	ENTER '1'
NO AWARD	ENTER '0'

#### **PLAYFIELD SPECIALS FEATURE: REGISTER 25**

This feature allows the operator the flexibility to award a REPLAY, EXTRA TIME UNITS, or SCORE (NOVELTY) when a special is scored.

AWARD	REGISTER 25
REPLAY	ENTER '3'
EXTRA TIME UNITS	ENTER '2'
NOVELTY (POINTS)	ENTER '1'
NO AWARD	ENTER '0'

## HIGH SCORE TO DATE OR OVER 10,000,000 SCORE FEATURE; REGISTER 26

The game is designed to award free games as an option if high score to date is beat or player exceeds 10,000,000 points. Each time this happens, the high score will reset to 1,999,990 as new high score to beat. This score is displayed on all 4 player score displays at the end of each game as an incentive to play.

HIGH SCORE	
TO DATE FEATURE	REGISTER 26
NO AWARD	ENTER '0'
ONE CREDIT	ENTER '1'
TWO CREDITS	ENTER '2'
THREE CREDITS	ENTER '3'

State and local laws may regulate the use of the above features, and they have been designed to allow for appropriate adjustment in order to conform to such requirements.

#### **SOUND OPTIONS; REGISTER 27**

#### SOUND MODE

The game is designed to make several tones and noises to announce power-up, game-up, etc. The tones are intended to atract to the game and increase game usage.

Four options may be selected by REGISTER 28.

#### Enter '0'

Most switches associated chimes without feature background.

#### Enter '1'

Playfield switches associated chimes with background.

#### Enter '2'

Most scoring will have a noise effect without background.

#### Enter '3'

Most all scoring will have a noise effect with background.

## NUMBER OF GAMES REPLAYS PER GAME ADJUSTMENT; REGISTER 31

LIBERAL - ENTER '1' All replays earned will be collected.

CONSERVATIVE - ENTER '0' Only 1 replay per player per game.

#### FREE PLAY; REGISTER 42

This feature is designed to enable the operator to set the game on FREE PLAY. Entering 65 sets the game into FREE PLAY mode. Entering any number other than 65 sets the game into the coin operated mode.

## HIGH SCORE FEATURE ADJUSTMENTS; REGISTERS 12, 13 & 14

The game is designed to award an extra ball (option) or a free game at each of three score levels. The recommended levels are on the score card in the game.

Any level from 0 to 9,999,999 can be set, as desired. It is also possible to reset or turn off any or all of the levels by entering '00' in the respective REGISTER.

TO DATE FEATURE	REGISTER 26
IO DATE PEATORE	
NO AWARD	ENTER '0'
ONE CREDIT	ENTER '1'
TWO CREDITS	ENTER '2'
THREE CREDITS	ENTER '3'

### HIGH SCORE TO DATE AND 10,000,000 FEATURE; REGISTER 15

The game is designed to award free games when 'High Score to Date' is beat or if the player exceeds 10,000,000 points.

It is recommended that the level, which will build with play, be periodically reset to the factory recommended level to encourage game play. The adjustment procedure is the same as for the High Score Feature Adjustment.

NOTE: THE HI-SCORE REGISTERS WILL REVERT BACK TO FACTORY SETTINGS IF THE CONTROL BOARD BATTERY FAILS. ALSO, THE HI-SCORE-TO-DATE WILL FLASH ALL 5'S IN ALL DISPLAYS DURING THE ATTRACT MODE.

## C. BEAT THE CLOCK FEATURE OPERATION & SCORING

This game is based upon playing time, not on balls per game. (See section "6".)

#### 1. TOP SAUCER FEATURE

Everytime the ball lands in the Top Saucer, the lit Saucer Value will be awarded. The Saucer Value is advanced by the Top Right Roll-over Button when the Right Lane Single Drop Target is down.

REGISTER 50 controls the Top Saucer Values:

VALUES	ENTER
In Memory	1
Reset	0

REGISTER 45 controls the Top Saucer Special:

ENTER
7
6
5
4
3
2
1
0

REGISTER 36 indicates the total number of Specials awarded from the Top Saucer.

Reset by entering "0".

The Top Saucer also adds 10 time units when the "Adds Time Units" arrow light is flashing. The arrow light flashes **ON** when the Right Lane Single Drop Target is down. The arrow light is **OFF** when the target is up/or 10 Time Units are collected in the Top Saucer. (See section "3".)

#### 2. TOP A-B-C-D ROLL-OVER LANE FEATURE

Each lane scores 5000 points and advances the Playfield Bonus. The Right Flipper Button changes the Top A-B-C-D Lane Lights.

\*REGISTER 52 controlls the Outlane Specials:

Special (Left then Right) Enter "0"	
Making A-B-C-D	Lites
1st time 2nd time * 3rd time * 4th time	"Playfield Scores Double" "Playfield Scores Triple" One Outlane Special Arrow Both Outlane Specials

#### Special (Left then Right) Enter "1"

Making A-B-C-D	Lites
1st time	"Playfield Scores Double"
2nd time	Triple & One Outlane
•	Special Arrow
* 3rd time	Both Outlane Specials

REGISTER 39 indicates the total number of Specials awarded from the Left Outlane. Reset by entering "0".

REGISTER 40 indicates the total number of Specials awarded from the Right Outlane. Reset by entering "0".

## 3. RIGHT LANE SINGLE DROP TARGET AND ROLL-OVER BUTTON FEATURE:

When the ball knocks down the Drop Target, 5000 points are awarded and the Top Saucer's "Adds 10 Time Units" arrow light flashes. The Drop Target resets when the Roll-over Button switch and any Top A-B-C-D Lane or Top Saucer switch is made. The Roll-over Button scores and advances flashing Right Lane Multiplier lights and their Values. The Button also advances the Top Saucer Value. The Bonus Multiplier Values reset from ball-to ball.

REGISTER 53 controls the Roll-over Button Special:

SPECIAL ON	ENTER
with 40,000	1
after 40,000	0

REGISTER 38 indicates total number of Specials awarded from Roll-over Button feature.

Reset by entering "0".

#### 4. LEFT SAUCER FEATURE:

The Saucer scores 1000 points or the Playfield Bonus times the lit Bonus Multipliers. The Saucer also adds 5 Time Units if the "Add 5 Time Units" light is **ON**.

REGISTER 46 controls the Left Saucer collect Bonus:

PLAYFIELD BONUS COLLECTED	ENTER
and recalled	1
and reset	0

REGISTER 54 controls the "Add 5 Time Units" light:

ADD 5 TIME UNITS LIGHT	ENTER
Always ON	1
Alternates ON/OFF	0
Each time collected	

## 5. SIDE DROP TARGET AND T-I-M-E-R FEATURE:

Knocking down each Side Drop Target or each T-I-M-E-R Target scores 3000 points. Knocking down the Drop Targets also advances the Playfield Bonus. Knocking all Drop Targets down scores the lit Value and flashes the T-I-M-E-R Target lights. Making all T-I-M-E-R Targets adds 25 Time Units on the clock and resets the Side Drop Targets.

REGISTER 43 controls the Side Drop Target Special:

#### SIDE DROPTARGET SPECIAL ON WITH ENTER

3
2
1
0

REGISTER 44 controls the Drop Target Value:

#### SIDE DROP TARGET VALUES

ADVANCE WITH	ENTER
Drop Targets made	1
T-I-M-E-R made	0

REGISTER 37 indicates the number of Specials awarded from the Side Drop Target feature.

Reset by entering "0".

#### 6. CLOCK FEATURE

Each player plays his ball in the proper playing sequence (i.e. 1st player, 2nd player, etc.) until his Time Units run out. Players may play as many balls as they can until their Time Units run out. When there is no time left on the clock and the ball enters the outhole, that player's game is over ("0 00" on readouts). When that happens, the remaining players continue to play their balls in the proper playing sequence.

Time remaining for each player is shown in two ways:

- For the player-up: The Playfield clock lights and the readout flashes the score only when a) the clock is running (faster flash) or b) on a new ball (normal flash).
- 2. For the remaining players: each readout will alternate between player's score and the time remaining. (The time remaining light will alternate **ON** also.)

A running clock can be stopped by hitting the flashing "S-T-O-P" Targets. (See REGISTER 51 below.)

A stopped clock can be started by hitting a flashing "Start Clock" Roll-over Button. (See REGISTER 47 and 56 below.)

Making both return lanes adds Time Units. (See REGISTER 55 below.)

REGISTER 47 controls the "Start Clock", Roll-over Buttons:

START CLOCK ROLL-OVER BUTTONS	<b>ENTER</b>
alternate	1
both FLASHING	0

REGISTER 48 controls the clock speed.

CLOCK SPEED COUNTDOWN	ENTER
slowest	7
slower	6
slow	5
medium slow	4
medium fast	3
fast	2
faster	1
fastest	0
	1 0

REGISTER 49 controls the Start-of-Game Time Units:

TIME UNITS START	ENTER
3:00	7
2:45	6
2:30	5
2:15	4
2:00	3
1:45	2
1:30	1
1:15	0

REGISTER 51 controls the "S-T-O-P" Target lights:

S-T-O-P TARGET LIGHTS	ENTER
Change on Right Flipper Button	1
Do Not Change	0

REGISTER 55 controls the Return Lanes:

MAKING BOTH RETURN LANES ADDS	ENTER
10 Time Units	1
5 Time Units	0

REGISTER 56 controls when the clock starts:

CLOCK STARTS	<b>ENTER</b>
When any scoring occurs	1
As above, also automatically if the ball	
remains in the shooter alley for	_
an inappropriately long time (15 sec.).	0

#### 7. MISCELLANEOUS:

Each Thumper Bumper scores 1000 points. Each Sling Shots score 30 points.

**NOTE:** There is no Outhole Bonus on this game. Appropriate Bonuses are collected in each Saucer.

REGISTER 58 controls the Game Over Attract Speech:

GAME OVER ATTRACT SPEECH ENTER
ON 1
OFF 0

This game has been designed to attract attention in the 'Game Over' mode by saying "Beat the Clock!" approximately every 2½ minutes.

REGISTER 59 controls the clock animation between balls:

ANIMATION	ENTER
ON	1
OFF	0

REGISTER 60 controls the Tilt Warnings (per ball):

3 = 3 Tilt Warnings 2 = 2 Tilt Warnings

1 = 1 Tilt Warning 0 = None (immediate tilt)

**REGISTER 61 controls the Sling Shots:** 

1 = Sling Shots active

0 = Sling Shots not active

REGISTER 62 controls the Default Values:

SETS ALL VALES TO	ENTER
Factory (or recommended) settings	1
No effect	0

#### D. BOOKKEEPING METERS

The program in this game has been structured to provide the operator with what we believe to be a simple and efficient method of determining **how** game specials are being awarded. The following

REGISTERS display specific 'Special Award' areas so the operator can readily see how liberal or conservative a particular feature or group of features is performing:

STANDARD REGISTERS		
REGISTER	# DISPLAYS	
1	Total Plays	
2	Total Replays	
6	Total Number of Times the Hi-Score is beaten	
7	Game Percentage	
8	Total Game Time (Minutes)	
11	Total Specials Awarded from Playfield Only	
33	Total Specials Awarded from Threshold #1	
34	Total Specials Awarded from Threshold #2	
35	Total Specials Awarded from Threshold #3	

SPECIAL REGISTERS		
REGISTER#	DISPLAYS	
36	Total Specials Awarded from the Top Saucer	
37	Total Specials Awarded from the Drop Targets	
38	Total Specials Awarded from Roll-Over Lanes Feature	
39	Total Specials Awarded from Left Out Lane Feature	
40	Total Specials Awarded from Right Out Lane Feature	
41	Total Number of Extra Time Intervals Awarded	

After reviewing the above **REGISTERS**, you may wish to tailor a feature or two for your location. Simply review the game's FEATURE, OPERATION AND SCORING section of this manual.

**NOTE:** All the above registers can not be altered - they may only be reset by entering '0'.

## V. PLAYFIELD PANEL POST ADJUSTMENTS:

Posts that control left and right outlane opening on panel can be removed to make access to outlanes easier or harder for ball to enter. See Figure II.

Easier entry will decrease playing time and scoring (conservative).

Harder entry will increase playing time and scoring (liberal).

## VI. RECOMMENDED LIBERAL & CONSERVATIVE REGISTER SETTINGS

REGISTER	FUNCTION	LIBERAL	CONSERVATIVE
43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61	Drop Target Special Drop Target Values Step Up Saucer Special Recall Bonus Alternate Start Roll-over Buttons Clock Speed Clock Initial Time Recall Saucer Values Rotate S-T-O-P Outline Special Roll-over Button Special Alternate 5 Time Units (Saucer) Return Lanes Clock Starts Power Frequency Attract Speech Animation Tilt Warnings Sling Shots	2 (at 150K) 1 6 (at 40K) 1 1 5 (slow) 4 (2:15) 1 1 1 1 1 1 1 1 1 1	1 (at 200K) 1 5 (at 50K) 1 1 2 (fast) 5 (2:30) 1 1 1 1 1 1 1 1 1 1
62	Default	<b>O</b>	3

REPLAYS	LIBERAL	CONSERVATIVE
Instruction Card Score Cards Playfield Specials	M051-00C70-A030 M051-00C70-A039 Register 25,enter "3"	M051-00C70-A030 M051-00C70-A038 Register 25, enter "3"
Match High Score to Date (3 Replays)	Register 29, enter "1" Register 26, enter "3"	Register 29, enter "1" Register 26, enter "3"
EXTRA TIME UNITS		
Instruction Card Score Card	w	M051-00C70-A031 M051-00C70-A035 /M051-00C70-A075
Playfield Specials		Register 25, enter "2"
Match High Score to Date		Register 29, enter "0" Register 26, enter "0"
NOVELTY		
Instruction Card Score Card Playfield Specials	M051-00C70-A032 M051-00C70-A036 Register 25, enter "1"	M051-00C70-A032 M051-00C70-A036 Register 25, enter "1"
Match High Score to Date	Register 29, enter "0" Register 26, enter "0"	Register 29, enter "0" Register 26, enter "0"

<sup>\*</sup>NOTE: In the Extra Time Units setting, Use Score Card # M051-00C70-A037.

#### **BEAT THE CLOCK** VII. RECOMMENDED INSTRUCTIONS, SCORE CARDS & HIGH SCORE FEATURE SETTINGS

#### LIBERAL

#### **CONSERVATIVE**

#### **REPLAYS**

Instruction Card Score Card 1 Replay at 1,000,000

1 Replay at 2,000,000

M051-00C70-A030 M051-00C70-A039 **REPLAYS** 

Instruction Card Score Card

M051-00B42-A030 M051-00B42-A035

1 Replay at 2,000,000

1 Replay at 3,000,000

#### **EXTRA TIME UNITS**

Instruction Card Score Card

M051-00C70-A031 M051-00C70-A039 w/M051-00C70-A075\*

25 Time Units at 1,900,000 25 Time Units at 2,500,000

\*(Use M051-00C70-A037 if no thresholds are used.)

#### HIGH GAME TO DATE (reset periodically)

LIBERAL ......3,000,000

CONSERVATIVE......4,000,000

#### **ADDITIONAL CARDS**

REPLAYS		
M051-00C70-A040	800,000	1,300,000
M051-00C70-A041	800,000	1,400,000
M051-00C70-A042	800,000	1,500,000
M051-00C70-A043	1,000,000	1,500,000
M051-00C70-A044	1,000,000	1,600,000
M051-00C70-A045	1,200,000	1,600,000
M051-00C70-A046	1,200,000	1,800,000
M051-00C70-A047	1,300,000	2,000,000
M051-00C70-A048	1,400,000	2,000,000
M051-00C70-A049	1,600,000	2,200,000
M051-00C70-A050	1,800,000	2,500,000
M051-00C70-A051	1,900,000	2,500,000
M051-00C70-A052	2,000,000	2,700,000
M051-00C70-A053	2,100,000	3,000,000
M051-00C70-A054	2,300,000	3,100,000
M051-00C70-A055	2,500,000	3,300,000
M051-00C70-A056	2,700,000	3,400,000
M051-00C70-A057	2,900,000	3,600,000
M051-00C70-A064	3,000,000	3,900,000
M051-00C70-A065	3,000,000	3,900,000
M051-00C70-A066	3,200,000	4,300,000
M051-00C70-A067	3,500,000	4,500,000

#### **EXTRA TIME UNITS**

M051-00C70-A071	900,000	1,500,000
M051-00C70-A072	1,000,000	1,600,000
M051-00C70-A073	1,200,000	1,800,000
M051-00C70-A074	1,400,000	1,900,000
M051-00C70-A075	1,900,000	2,500,000
M051-00C70-A076	2,300,000	3,100,000
M051-00C70-A077	2,700,000	3,400,000

#### **NOVELTY** M051-00C70-A032 M051-00C70-A036

## VIII. TROUBLESHOOTING ON LOCATION

1A)

#### SYMPTOM:

Game does not play power-up tune when power is turned on. General illumination is present.

#### **ACTION:**

A) Turn power OFF. Open back box. Locate light emitting diode (LED) on Control Board.

B) Turn power ON. LED must flash 8X to indicate that the module is good. Correct sequence is flash-pause-flash and then six more flashes and LED goes out.

C) If LED does not come on, or does not flash, or flashes, but less than 8X, 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.

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

#### 2A)

#### SYMPTOM:

Not all feature lamps light during play.

#### **ACTION:**

- A) With power ON, open front door. Enter '90' on 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 correct, it is now ready for play.\* If game is not correct, contact the Bally-Midway service department.

#### 2B)

#### SYMPTOM:

One or some switched lamps always ON.

#### **ACTION:**

Repeat 2AA, AN, AE, and AF.

#### 3A) SYMPTOM:

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.

\*Turn power ON-OFF switch OFF and then ON.

#### **ACTION:**

- A) With power ON, open front door. Enter '91' on keyboard. If the game is correct, each digit on each Display Driver Module (5 used/game) displays the count 0 - 9 continuously 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.

#### 3B)

#### SYMPTOM:

All displays improper (all five Display Driver Modules). Improper: Digit(s) always on or off/segment(s) always on or off, all displays.

#### **ACTION:**

- A) Repeat 3AA, and AB.
- B) Replace Control Board. See CAUTION NOTE, 1C. Turn power ON. Repeat A.
- C) If game is correct, it is now ready to play.\* If game is not correct, contact the Bally-Midway service department.

#### 3C)

#### SYMPTOM:

One or several displays always off.

#### **ACTION:**

- A) Do 3AA, AB, AC, and AD.
- B) Repeat 3BB and BC, if necessary

#### 4A)

#### SYMPTOM:

Solenoid(s) do(es) not pull-in during course of game.

#### **ACTION:**

- A) With power ON, open front door. Enter '92' on keyboard.
- B) If game was correct, each solenoid would be energized. A number is flashed on the Player Score displays as each solenoid is pulsed. Note any numbers that do not have the sound of an associated solenoid. (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.) See Solenoid Identification Table on page 1-18.

- 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 AA & AB. 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 AA & AB if game is correct. It is now ready to play. If game is not correct, turn power OFF.
- Replace Control Board. See CAUTION NOTE, 1C.
- J) Repeat A & B. If game is correct, it is now ready to play.\* If game is not correct contact the Bally-Midway service department.

#### 4B) SYMPTOM:

Solenoid(s) 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:

Do 4AA, AB, AE, & AF.

#### 5A) SYMPTON:

No sound.

#### **ACTION:**

- A) With power ON, open front door. Enter '93' on 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.

#### 6A) SYMPTOM:

Feature (Drop Targets, etc.) does not score.

#### **ACTION:**

A) With power ON, open front door. Enter '94' on keyboard.

- B) If the game is correct, Match/Bill in Play display would flash '94' and the Player Score displays flash '0'. If a number other than '0' appears on the Player Score displays, see SWITCH ASSEMBLY IDENTIFICATION TABLE on page 1-18.
- C) Carefully lift the playfield. Locate the switch asembly identified from the number. Visually inspect the switch assembly. If the contacts are stuck, re-gap them to 1/16". See section under SWTICH ASSEMBLY ADJUSTMENTS On page 1-20. Repeat A & B. If the game is correct, it is now ready to play.\* If game is not correct, turn power OFF.
- D) Replace Control Board. See CAUTION NOTE, 1C.
- 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.

\*Turn power ON-OFF switch OFF and then ON.

#### **BEAT THE CLOCK**

#### X.

#### SOLENOID IDENTIFICATION TABLE

SELF TEST #	SOLENOID IDENTIFICATION	SELF TEST #	SOLENOID IDENTIFICATION
1 2 3 4 5	LEFT SAUCER MIDDLE SAUCER LEFT BUMPER RIGHT BUMPER MIDDLE BUMPER SINGLE DROP TARGET RESET	7 8 9 10 11 12	6 DROP TARGETS RESET LEFT SLINGSHOT RIGHT SLINGSHOT OUTHOLE KNOCKER FLIPPERS

#### SWITCH ASSEMBLY IDENTIFICATION TABLE

SWITCH SELF TEST #	DESCRIPTION	SWITCH SELF TEST #	DESCRIPTION
1	DROP TARGET 1	25 26	RIGHT BUMPER MIDDLE BUMPER
2	DROP TARGET 2	20 27	LEFT BUMPER
3	DROP TARGET 3	28	RIGHT SLINGSHOT
4 5	DROP TARGET 4	29	LEFT SLINGSHOT
5	DROP TARGET 5 CREDIT	30	RIGHT START
6 7	DROP TARGET 6	31	LEFT START
8	OUTHOLE	32	RIGHT ROLLOVER BUTTON
9	COIN III (RIGHT)	33	STOP "S"
10	COIN I (LEFT)	34	STOP "T"
11	COIN II (MIDDLE)	35	STOP "O"
12	LANE CHANGE	36	STOP "P"
13	LEFT RETURN LANE	37	LANE "A"
14	SLAM	38	LANE "B"
15	TILT	39	LANE "C"
16	RIGHT RETURN LANE	40	LANE "D"
17	TIMER "T"	41	NOT USED
18	TIMER "I"	42	NOT USED
19	TIMER "M"	43	NOT USED
20	TIMER "E"	44	NOT USED
21	TIMER "R"	<b>45</b>	SINGLE DROP TARGET
22	NOT USED	46	LEFT SAUCER
23	LEFT OUTLANE	47	MIDDLE SAUCER NOT USED
24	RIGHT OUTLANE	48	NOT USED

#0C70 BEAT THE CLOCK
INDICATES SWITCH
ASSEMBLY IDENTIFICATION
NUMBERS
NOTE: CABINET: 06

IOTE: CABINET: 06 DOOR: 09, 10, 11

INDICATES SOLENOID
IDENTIFICATION NUMBERS
NOTE: BACKBOX: 12
CABINET: 11

VECTOR SHOWING FOR LEFT EJECT SAUCER

VECTOR SHOWING FOR CENTER EJECT SAUCER

BALL SHOULD EXIT AS SHOWN

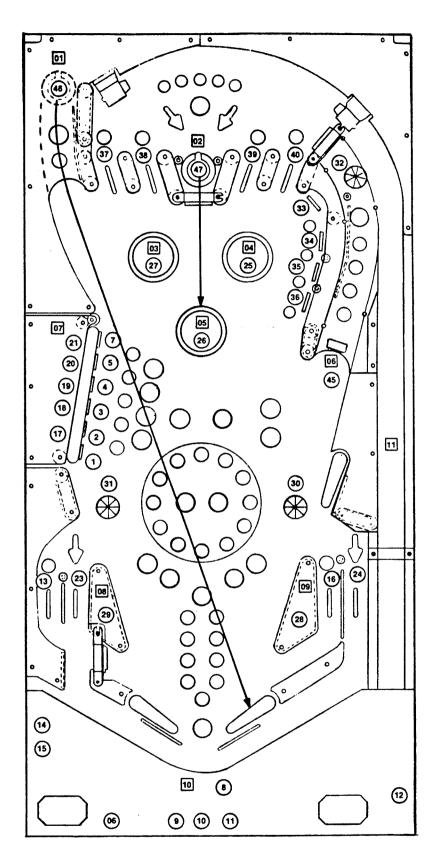


FIGURE I

## X. 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 assemble 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 or file Gold Plated Switch Contacts.

#### XII. 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 finish 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.

#### XI. SWITCH ASSEMBLY ADJUSTMENTS:

#### **GENERAL:**

tikla (. s

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 contact 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.

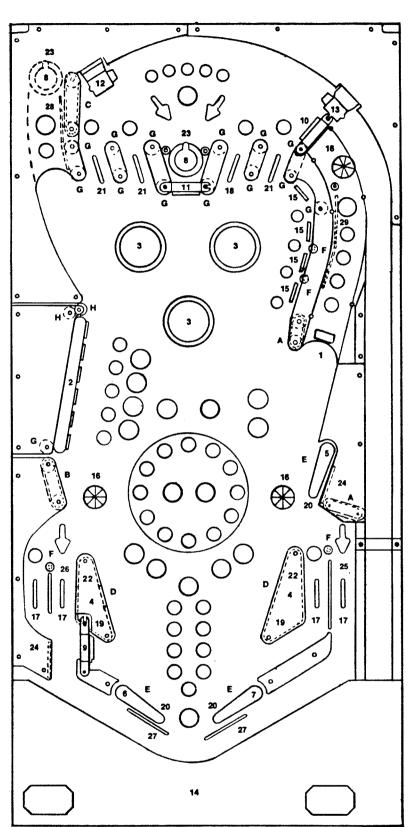


FIGURE II

#### 0C70 BEAT THE CLOCK RUBBER RINGS & BUMPERS

#### RINGS

1111	143	
A.	0017-00041-0642	(2) 1.D. 3/4"
B.	0017-00041-0643	(1) I.D. 1"
C.	0017-00041-0645	(1) I.D. 2"
D.	0017-00041-0646	(2) I.D. 2 1/2"

#### **BUMPERS**

E.	0017-00041-0682	(3) FLIPPER RED-I.D. 3"
F.	0017-00041-0633	(4) PLASTIC POST-1"
G.	0017-00041-0637	(14)PLASTIC POST-1 1/4"
Н.	0017-00041-0641	(2) METAL POST

#### PANEL TOP PARTS

1.	DROP TARGET ASSY L.H. SINGLE	AC70-00021-0000
2.	DROP TARGET ASSY 6 DT & 5 ST	AC70-00016-0000
3.	THUMPER BUMPER ASSY.	A967-00053-0000
4.	SLINGSHOT KICKER ASSY.	A967-00059-0000
	FLIPPER ASSYSINGLE	A C70-00022-0100
	SWITCH RT.	
6.	FLIPPER ASSYSINGLE	AC70-00022-0200
	SWITCH LT.	
7.	FLIPPER ASSYDOUBLE	AC70-00023-0100
	SWITCH RT.	
8.	EJECT HOLE ASSY.	A360-00295-0000
9.	WIRE GATE ASSY.	A C70-00027-0000
	WIRE GATE ASSY.	A360-00212-0000
11.	WIRE GATE ASSY.	A967-00058-0000
12.	WIRE GATE ASSY. BALL GATE ASSYLT. BALL GATE ASSYRT.	A360-00022-0000
13.	BALL GATE ASSYRT.	A360-00023-0000
	BOTTOM ARCH ASSY.	AC70-00024-0000
15.	RED TARGET SWITCH	AA17-00027-0000
	& BRKT. ASSY.	
16.	ROLLOVER BUTTON	AB38-00028-0000
	SWITCH	
17.	ROLLOVER WIRE SW.	A967-00067-0000
	& DIODE ASSY.	
18.	ROLLOVER WIRE SW.,	A360-00603-0003
	DIODE & CAP ASSY.	
19.	SLINGSHOT (10) PT.	A360-00239-0000
	SWITCH AND DIODE ASSY.	
20.	MOLDED FLIPPER	A967-00031-0000
	ASSYWHITE	
21.	ROLLOVER WIRE	AB38-00026-0000
	SWITCH ASSY. SLINGSHOT (10) PT.	
22.		A360-00230-0000
00	SWITCH ASSY.	A 005 00000 0000
23.	EJECT HOLE SWITCH	A365-00230-0000
0.4	ASSY.	0000 00175 5000
24.	BALL GUIDE WIRE 2"	0360-00175-5600
20. 26	BALL GUIDE WIRE 3-5/8"	0360-00175-0106
	BALL GUIDE WIRE BUFFER WIRE	0360-00175-8400
	BALL GUIDE WIRE	0360-00175-5300 0C70-00905-0000
	BALL GUIDE WIRE	
29.	DALL GUIDE WIRE	0C70-00909-0000

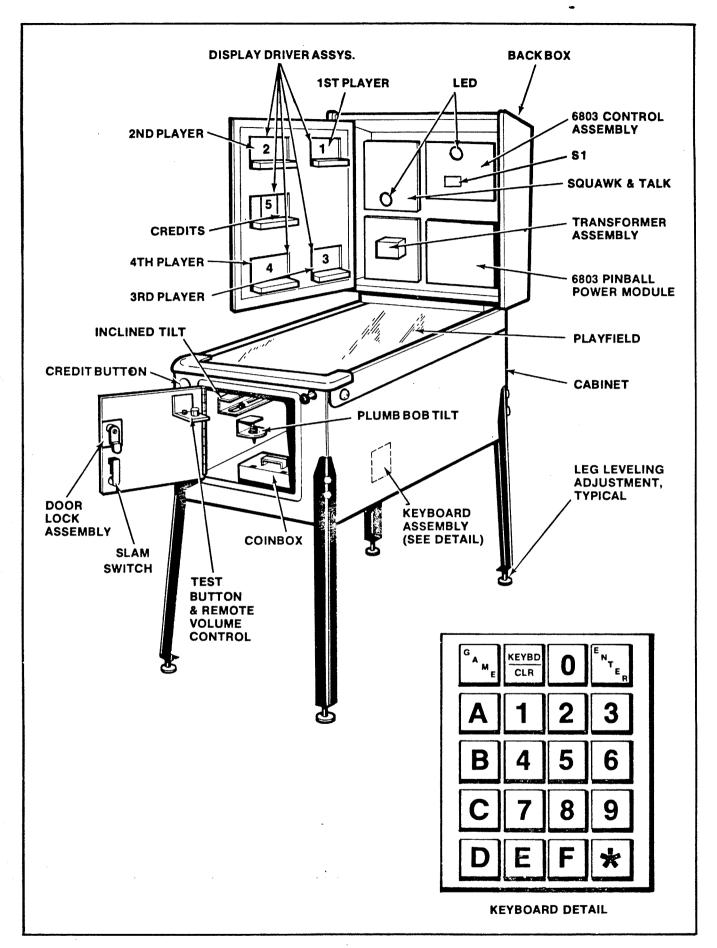


FIGURE III. ELECTRONIC PIN BALL MACHINE

#### XIII. ABBREVIATED PARTS LIST BEAT THE CLOCK

MISCELLANEOUS	MIDWAY PART NUMBER	BALLY PART NUMBER
Transformer (Domestic or Export)  Bulbs, #555.  Lamp Socket w/Diode (IN4004).  Lamp Socket w/Diode (IN4004).  Lamp Socket w/Diode (IN4004).  Lamp Socket w/o Diode.  Fuse, 1 Amp. 3 AG Slow Blow (Playfield Solenoid Protection).  Fuse, 3A, 3 AG Slow Blow  Fuse, 6A, 3 AG.  Front Molding Assy.  Keypad Assy.  Ball Shooter Rod & Spring Assy. (Cabinet).  Plumb-Bob: Tilt.	0017-00003-0301 0017-00031-0053 0017-00031-0054 0017-00031-0058 0017-00003-0103 0017-00003-0007 0017-00003-0008 A360-00086-0000 A365-00074-0000 0C70-00900-0000 A360-00280-0000 0360-00900-0000 0017-00009-0019	E-120-200 E-120-201 E-120-210 E-133-44 A-3080-14 ASE-2378-5 E-138-3
Credit Pushbutton - Red/White (Cabinet) Pushbutton - White (Cabinet) (2) Back-Box: Generic Playfield Support Allen Wrench: 1/8" Ball: 1-1/16" Dia. Steel Ball: 15/16" Dia. Steel	0365-00521-0100 0360-00114-00XF 0017-00009-0551 0017-00009-0546	P-1455-1 M-1718-7 M-168-26 M-168-50
ASSEMBLY SWITCHES		
Roll-over Button (3)	. A365-00060-0100 . 0017-00005-0183	ASW-A1-152 ASW-A1-209
Coin (2) (Door) Lane Change (Cabinet) Right Sling Shot (2) Left Sling Shot (2) Thumper Bumper - Make (3) Tilt (Cabinet)	. A370-00078-0000 . A360-00069-0000 . A360-00069-0000 . A967-00074-0000 . A360-00054-0000	ASW-A1-56 ASW-A1-47 ASW-A1-47 ASW-A1-195 ASW-A0-13 ASW-A2-73
Slam (Cabinet) Tilt (Door) Tilt (Door) Right Lanes (Out Lane & Ball Lane) (2) Left Lanes (Out Lane & Ball Lane) (2) Flipper - Double Sw Make Flipper - Double Sw Break	. A360-00070-0000 . A360-00070-0000 . A365-00046-0000 . A365-00045-0000	ASW-A1-48 ASW-A1-48
Flipper - Break (2)	. A365-00045-0000 . A360-00071-0000 . A967-00076-0200 . A967-00076-0100	ASW-A1-61
Drop Target (Drop Target Assy.) (6)	A360-00062-0000	ASW-A1-168

## XIII. ABBREVIATED PARTS L1ST(cont'd) BEAT THE CLOCK

ACCENTULY COIL C	MIDWAY PART NUMBER	BALLY PART NUMBER
ASSEMBLY COILS		***
Flipper (3)		AQ-25-500/ 34-4500
Knocker	A360-00046-0000	AR-26-1200
Outhole Kicker	A360-00044-0000	AN-26-1200
Thumper Bumper (3)	A360-00044-0000	AN-26-1200
Saucer	A360-00211-0000	A0-27-1300
Sling Shot (2)	A967-00046-0000	A0-26-1200
Drop Target (Drop Target Assy )(5)	A360-00209-0000	
Left Hand Single Drop Target	A360-00211-0000	A027-1200
PLAYFIELD PARTS	See Figure II	
	0260 00021 0000	G-409
Playfield Glass	4.C70_00501_00YF	Q=400
Playfield & Inserts	0017-00001-0071	C-900
Roll-over Button - White (3)	0017-00042-0405	C-901-4
Button: Roll-over Mounting - Green (2)	0017-00042-0541	C-901-8
Button: Roll-over Mounting - Amber	0070-00903-0000	
Playfield Mylar	AC70-00011-00XF	
Post: L=1" Blue Plastic (10)(2)	0017-00042-0586	
Post: L=1-3/16" Blue Plastic (25)	0017-00042-0594	
Acorn Nut: Nylon (25)	0017-00009-0302	M-1794-1
Thumper Bumper Cap & Tape Assembly (2)	AC70-00015-0000	
Collar-Thumper Rumper - Blue (3)	0017-00042-0567	
Thumper Rumper Locking Ring (2)	0017-00042-0414	
Thumper Rumper Mylar Shield(3)	0331-00903-0000	
Flipper - White (3)	A967-00031-0000	A-3994-5
MODULES		
6803 Pinball Power Module w/Fuses	A084-91785-AC70	
Squawk & Talk	B084-91625-AC70	AS-2518-61
6-Digit Display Driver (1 used)	B084-91491-A000	AS-2518-21
7-Digit Display Driver (4 used)	B084-91617-A000	AS-2518-58
6803 Pinball Control Module	. B084-91786-AC70	

#### **MODULE COMPONENTS**

SEE MODULE PARTS LIST

## SECTION 3 Component Layouts, Schematics & Wiring Diagrams

FUSE CLIPS
12 PIN M-N-L CONN. FEMALE
6 PIN M-N-L CONN. MALE
15 PIN M-N-L CONN. MALE
9 PIN M-N-L CONN. MALE
12 PIN M-N-L CONN. MALE
2 PIN M-N-L CONN. MALE
P.C. BOARD ZERO OHM RES. JUMPER TEST POINTS 5 AMP 3AG FUSE 3/4 AMP 3AG FUSE 6 AMP 3AG FUSE 8 AMP 3AG FUSE 15 AMP 3AG FUSE 3/16 AMP 8AG FUSE FUSE CLIPS 3-1 \* TWO FLIPPER GAMES ONLY + SEE SCHEMATIC DESCRIPTION FC1A - FC3B, FC8A, FC8B FC4A - FC7B DESIGNATION LIST 6803 POWER MOD. DESIGNATION JW1 - JW16 TP1 - TP10 6803 PINBALL POWER MODULE A084-91785-C000 M051-00C53-C001 F4, F5 F6, F7 6-32 HEX NUT LABEL - CAUTION HIGH VOLT. 11,000uf 20V ELEC. TY-WRAP SOLDER LUG WIRE 20AWG 160uf 350V ELEC. TY-WRAP 8.2K 1/4W 5\$ 0 - 25K 1/4W POT. MR751 SHIELD
HEX SPACER
6-32 X 5 SCREW
LOCKWASHER EXT.
LOCKWASHER INT.
FLAT WASHER HEATSINK 2 INSULATOR TO-66 2N3440 HEATSINK 3 78H05C REG. 6-32 X 12 SCREW 2uf 25V ELEC. .luf 25V CER. .0luf 50V CER. .00 UHM 10W 100K 1/4W 5\$ 2.2 OHM 1/4W 5\$ 100 OHM 1/2W 5\$ 100K 1W 5\$ 100K 1W 5\$ 1.2K 1/4W 5\$ 1.2K 1/4W 5\$ 82K 1/4W 5\$ FLAT WASHER
HEATSINK 1
INSULATOR TO-3
VARISTOR IN5275A ZENER KBPC-35-02-W BRIDGE SPACER 2N3584 6-32 HEX NUT LOCKWASHER EXT. INSULATOR TO-5 DESCRIPTION N4004 DESIGNATION LIST DESIGNATION D10 BR1 P/0 BR1 Q1 - 04 - 09 ۲ ۲ 01 9MF JW3 JW4 JW9 JW10 JW13 JW 14 JW 15 JW 16 PLAYFIEL

PLAYFIEL

PLAYFIEL

OF BATTVAC

OF BATTVAC 194 O , O . A080-91785-C000 PAT. PENDING OTPS •43VDC SOL £C38 +5V REG 230VDC 100 90V OU  $\bigcirc_{_{\mathcal{I}\!\!R}}$ ©1985 BALLY MIDWAY MFG, CO. 6803 PINBALL POWER MODULE ALL RIGHTS RESERVED -190VD EG28 230 IN JB FC58 ØB FC7A FC4B ØA FC6A GLP.F. G.I.B.B. TPR 6.3VAC 

0017-00003-0387 0017-00003-0011 0017-00021-0532 0017-00021-0424 0017-00021-0425 0017-00021-0428

PART NOS.

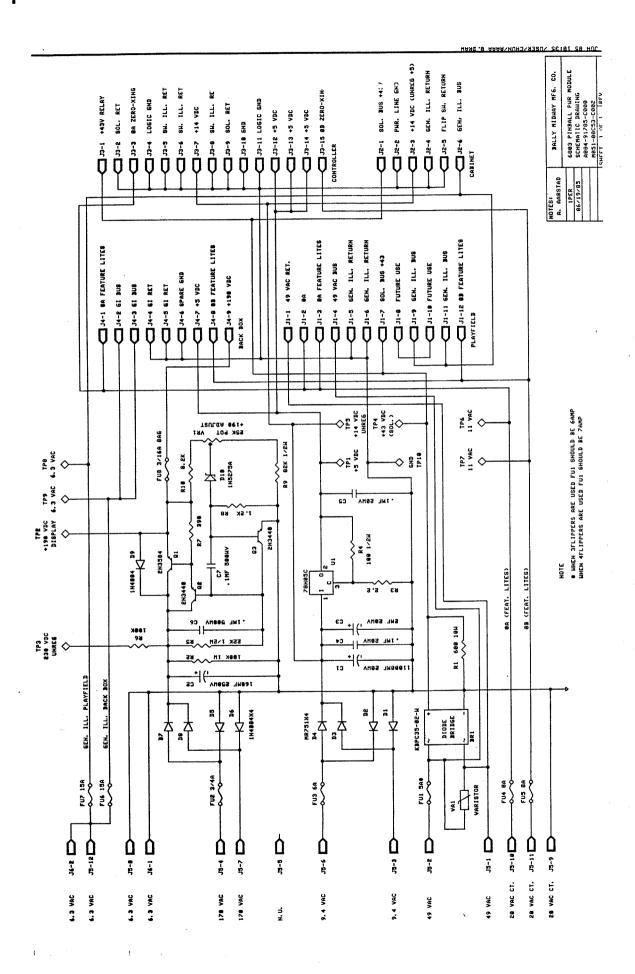
15	OTY. DESIGNATION NO.		74.	2 10	FEMALE		_ ·		MALE 1 JS	_						ES ONLY - SEE SCHEMATIC																																
CROSS REFERENCE LIST	DESCRIPTION		A AMP 3AG FUSE	. 2	12 PIN M-N-L CONN	6 PIN M-N-L CONN.	I-N-M NIG ST	Ĭ	12 PIN M-N-	•						YING SAMAS asaas to com a	•			10.	~	2	_ (	7 0	o <del>-</del>		_	8	•	(	ao ao			2	•	=	22	0.1	95		60	9.	53	5	4 Y	0.0		
	PART NOS.	0460-00800-0013	0360-00800-0026	0360-00800-0019	0360-00800-0020	0360-00800-0024	100E-00005-0003	100E-00006-0021	100E-00005-0049	100E-00002-0049	100E-00005-0063	100E-00005-0086	100E-00006-0065	100E-00006-0072	100E-00005-0115	100E=0000/=000/	0.56U=00004=0004	103E-00003-0005	103E-00001-0027	103E-00005-0005	104E-00003-0002	104E-00005-0002	0360-00803-0021	115E-00001-0002	1175-00042-0048	0017-00007-0131	0017-00021-0257	0017-00033-0448	0017-00042-0119	0017-00042-0151	0017-00042-0158	0.00042-00042-0248	1125-00001-0003	1125-00001-0002	112E-00001-0004	1186-00001-0001	0017-00101-0132	0017-00101-055	0017-00103-0005	0017-00104-0008	0017-00104-0009	0017-00104-0106	0017-00071-0033	1500-15000-2100	001/-000/-1-0034	0017-00003-020	2000 C0000 L000	\ - \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	DESIGNATION NO.	.0	25				) Q	0.00	* C		- 00	0.8	) - IO	R9	R6	R2	VRI	01-04	40.00	286	02.03	10	U1		P/0 C1, C2	01401-1401	0.11.07.9		5		0	P/0 01						P/0 01			P/0 01,U1	P/0 01,U1	FC1A-FC3B,	FC8A, FC8R	FC4A-FC7A	Σ (		•
	OTY.	,	7 (	٠.												-		∢ .	n -		- 0	ı —		-	∢ ;	9 9	<u> </u>	٠,	· -	. 2	-	2 .				-	₹	2	4	4	4	4	60		€ .		_	•
TSI I BONDADDA SOCO	DESCRIPTION		.01UF 500V CER.	. 1UF 25V CER.	2UF 25V ELEC.	160UF 350V ELEC.	11,000UF 20V ELEC.	2.2 OHM 1/4W 5%	100 OHM 1/2W 5%	390 OHM 1/4W 2%	600 OHM 10W 1UK	1.2K 1/4W 5K	8.2K 1/4¥ 5%	22 1/24 5%	100K 1/4M 5%	100K 1W 5K	0-25K 1/4W POT	MR 751	1N4004	1N5275	KBPC-35-02-W	2N3440	2010101 2010101	VARISTOR METAL OXIDE 60V	TY-WRAP	ZERO OHM RES. JUMPER	TEST POINTS	SOLDER LUG	JUMPER WINE ZOAMS	INSULATOR TO 5	INSULATOR TO-66	HEX SPACER	SHIELD	HEATSINK 1	HEATSINK 2	HEALSINA 3	SKIDGE SPACER	ALMO X & COREM	6-32 HEX NUT	OCKWACHER INT.	LOCKWASHER EXT.	FIAT WASHER	FUSE CLIP		FUSE CLIP	3/16 AMP 8AG FUSE	3/4 AMP 3AG FUSE	

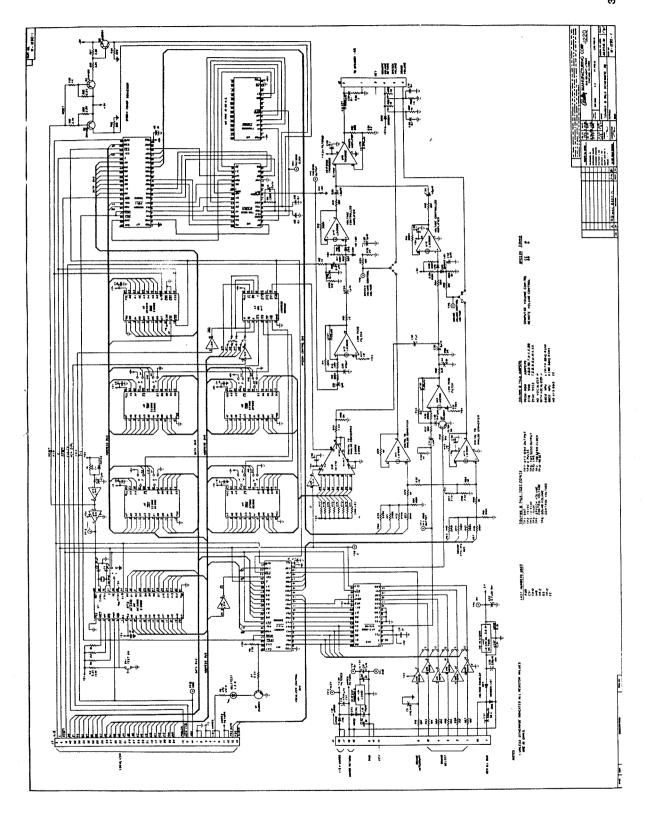
# Œ ⊕ • SQUAWK & TALK MODULE AS 2518-61A

BALLY PART #	P-29 <b>48-446b</b> E-620-171 E-712 E-620-197 E-620-167	E-620-168 E-620-33 E-620-33 E-620-33 E-620-186 E-620-168 E-620-167 E-710 E-700-168 E-105-238 E-105-238 E-105-228 E-105-237 E-105-237 E-105-238 E-105-238 E-105-238 E-105-238 E-105-238 E-105-238 E-105-238 E-105-238
DESCRIPTION	M-645-577b AD 558 DAC 24 Pin I.C. Socket 6821 P.I.A. Tms 5200 Speech	AY3-8912 Sound 6810 RAM (SEE NOTE 1) 6810 RAM (SEE NOTE 1) 4049 Hex Inverter LM 3900 LM 3900 TALS 14 Schmidt Inverter 74LS 155 TDA 2002 Power Amp Resistor, v.W. 5%, 3.3K Resistor, v.W. 5%, 200K Resistor, v.W. 5%, 27K Resistor, v.W. 5%, 27K Resistor, v.W. 5%, 27K Resistor, v.W. 5%, 27K Resistor, v.W. 5%, 91K
REFERENCE OTY. DESIGNATION		7 1 U12 8 1 U6 10 2 U13.U14 11 1 U15 12 1 U17 13 1 U18 14 VR1 15 1 U18 16 19 R10, 19, 29, 42, 50, 63-67, 77-78, 55 17 5 R2-5,8 18 2 R20, 58 19 2 R20, 44, 61 20 5 R3, 24, 46, 81 21 4 R33, 24, 46, 81 22 4 R30, 53, 56, 80 23 1 R35, 26, 27, 32, 49, 59, 60 25 1 R33, 26, 27, 32, 49, 59, 60

## SQUAWK & TALK MODULE AS 2518-61A COMPONENTS PARTS LIST

BALLY PART #	376 346	C#2-C01-	105-230	105-344	-105-228	-105-203	-105-248	105.161	976 100	0100	E-105-347	-105-243	-105-311	-105-211	106.303	505-501	105-345	-105-196	-105-360	:-105-223	586-85	500	200	E-105-207	E-103-342	E-286-90		E-586-89	E-586-83	E-586-120	E-586-68	F-586-135	F-586-73	26.136	200-100	1.000-124	171-000-171	E-586-123	E-586-147	E-586-150	E-736-18	E-736-6	E-682-11	F-682-8	P-5399	E.658.3	1,000	E-20/-13	E-20/- I*	0.000	E-0/3	12-202-21	E-712-10	E-20/-22	C 620 125 or 128	E-020-123-14	11717	1 CDD 00622-1106	Larn-Joseph 142	N-00032-2112	E-/00-20	C 505.63	E.500-16	E-586-148	E-305-140	11.1834	M-185*	C7-C9C-1	E-103-318		
DESCRIPTION	200 201	VW. 5%, 30K	V.W. 5%, 1K					Hespital, 74M, 5.%, 1500				27K				_		Resistor, VW, 5%, 1 Ω						Resistor, V.W. 5%, 2.2K		Capacitor, Electrolytic, 1 µF, 25V E				Capacitor Caramic 680F	_	_				747.60		_	8		18 Pin Water Connector (156)		(100)	Teatsink, occopi				Diode (iN4004)	Diode (IN4148)	tal, 3.579			Socket I.C. 16 Pan	Diode, VR332	6808 or 6802 (SEE NO! E 1)		Socket, I.C. 40 Pm		Screw	SZ.	Header, 20 Pin		Capacitor, 2µr, 16V	70. IA	aronyuc,	Hesistor, 828	Thermal Compound	Transistor, 2N4403	Resistor, V4W, 5%, Z.4K	JUMPERS—SEE NOTES	
REFERENCE CTV DESIGNATION	1	1 R37	5 R12, 36, 57, 58, 81			9	9.		1 R15	1 R14	A 817 18 39 40		-	200	<b>3</b>	3 P31.88.89	B79	300	250	2		10, 11, 17, 18, 44, 47-50	2 (23,36	4 R84-87		7 C19 24 25 28 31, 34, 42	10 C12 13 28 30 33 39 40 41.		<b>2</b>	23.53	33.5	55	- CIS	2 C16,22	1 C27	1 023	3		333	3,50	<u> </u>	- ·	75	1 Used with VR1	1 Used with U18	12	1 SW 1	3 CR7, 8, 10	5 CR1, 5, 6, 9, 11	, , , , , , , , , , , , , , , , , , ,	1 LED1	3 01-2,5	1 Used with U10	3 CR2-4	5 -						2 3		2 C36,43	2 R69, 70		_	AR Used with U18, VR1	Ť			
		*	22	. 6	8 8	3	8	9	S	g	3 2	5 8	3	8	37	8	8	3 \$	?	7	42	₹	1	Ą.	\$	2 5	7	Ŷ	;	9	3	2	S	ß	ā	8	5	3 0	ñ	8	3	8	5	8	8	2	8	8	67	8	2	2		2	£		74	75	76	1	. 82	!	8	8	8	8	8	£	8	}	





DE: GNATION	1817		
CH #01040	10114110100	DESIGNATION NO.	DESCRIPTION
	•	DSIMM	TACK-BCREW RPLCHMT
: :	: 5		DISPLAY ATG. TOP
,			DISPLAY MTG. BOTTOM
T M	OHM 1/4W		PRESSURE SERBITIVE
R2	OHM 1/4W		344
B3	OHM 1/4M		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7	OHM 1/4W		****
\$2	100K ORM 1/4M 55	-	.045 SQ. PIN
e i		•	
ž d	M# / 1 MHO	191-193	TEST POINTS
n e	OHM 1/4M		:
0.18	OHH 1/4M		CUMPER TIN 22 ANG
	OHR 1/4W		2000
+1.2	OHR 1/4W	A080-91491-A000	• Digit Distrai
R13	N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
<b>7</b>	DHH 1/4		
\$ T &	# H		
P16	JOUR ONN LAW SE		
C 1 d	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
20 00 00 00 00 00 00 00 00 00 00 00 00 0	174		
	OH# 1/6#		
	E C		
822			
823			
R24	OHN		
H25	OHM 1/4W		
978	OHH 1/4M		
R27-F.J	OHH		
<b>₹</b> 64	0 KM		
#35-#·0	JOSE ONN 1/4M SE		
	240K OHM 1/4M 54		
70-190	HHO		
R49-R1	20K OHM 1/4M 5E		
VR1	1H 3045A		
30-10	WPS-142		
. (0-20	245401		
013-020	NPS-842		
Ξ	MC16543		
;			
051	6 DIGIT DISPLAY		

24 cz+ oz 1 11111 1-0 1 cO	ו"ם המה יהי
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1 H 3 Q 4 \$ A

114E-60002 0003 104E-00001-0014 014G-00804-0014 014G-00804-0016 014G-00804-0016 014G-00145-0016

07-012 01-04 013-020 01 051 051MH

##S-A42 ##S-A42 # (1444) # (14

8017-0081 0095

11 191-193

TEST POINTS
JUNPER TIN 22 ANG
6 DIGIT DISPLAY
PCB.

.045 SQ. PIN

1.5K 1/4M 5E 1.5K 1/4M 5E 2.2K 1/4M 5E 20K 1/4M 5E 10K 1/4M 5E 10K 1/4M 5E 10K 1/4M 5E 20K 1/4M 5E

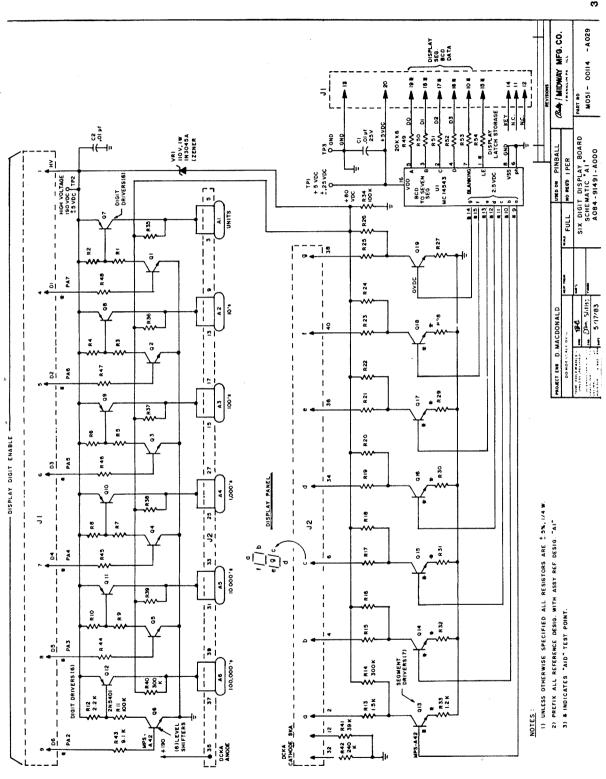
DESIGNATION NO.

CROSS NEF. LIST DESCRIPTION

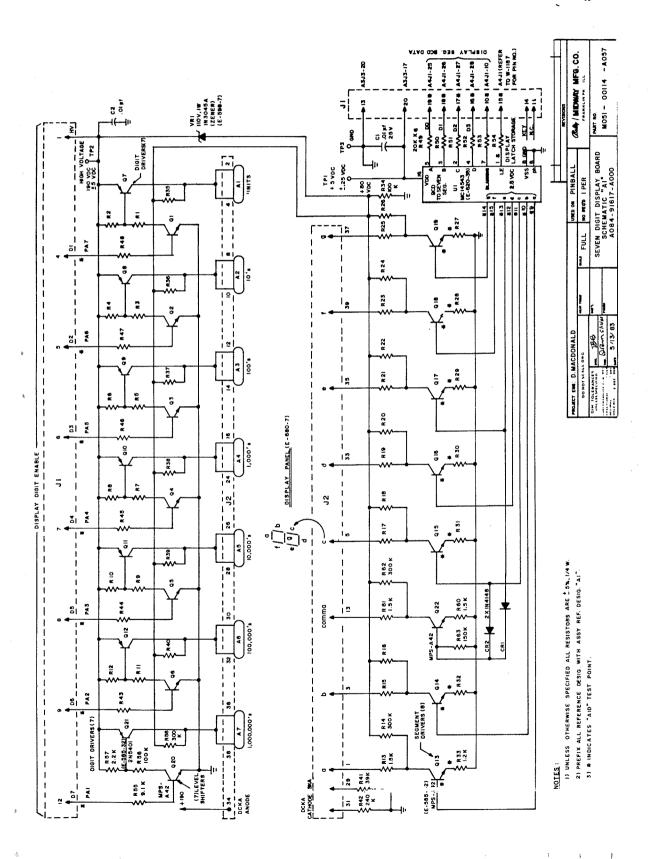
.01 MF 25V

PECV(BIOHS	CLAS / MIDWAY MFG.CO.	PRANKINPK ILL	DISPLAY PART NO.	
	NO GIRA	FULL NO. MEND 1 PER	ASSEMBLY DWG, SIX DIGIT DISPLAY	AGEE-91491-AGGG
		STRA STR	ś	-
	ARSTAD	. 0#c	BAK	11/14/84
	PROJECT EMS. A. AARSTAD	DONOTICAL! DEL	OHE TOLE RAHEEN	11/14/84



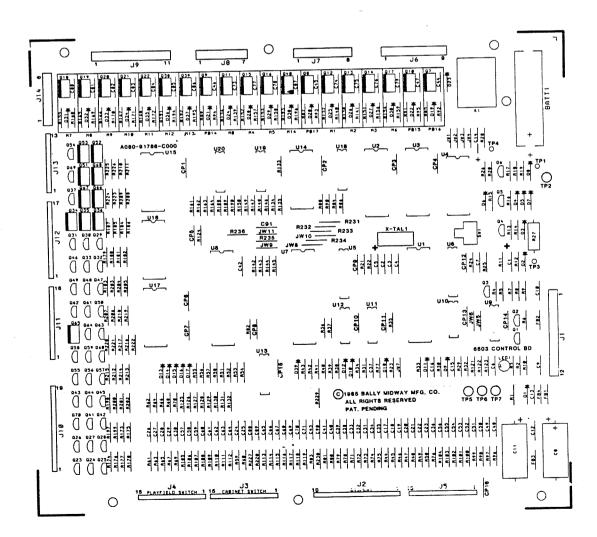


	NI DMAY'S PART NOS. 0360-00800-0005 0360-00800-0013	100E-00005-0063	(OCE-00005-0069 (OCE-00005-0095 (OCE-00005-0095 (OCE-00005-0105 (OCE-00001-0011	100E-00001-0125 100E-00001-0125 100E-00001-0127	103E-00001-0028 103E-00002-0005	3360-00802-0006 0360-00802-0007	0360-00803-0014	0360-00804-0022	0017-00042-0155	0017-00081-0095	0017-00041-0598	0017-00007-0131	AD80-91617-AD00	REVISIONS	CLA / MIDWAY MFG. CO.	MO51 - 00114 - A056
<b>13</b>	E-566-85 E-586-65	E-105-222 E-105-229	E-105-287 E-105-242 E-105-242 E-105-231 E-105-331	E-105-248 E-105-271 E-105-227	E-598-7 E-587-14	E-585-32 E-585-33	E-620-38	E-680-7	P-2399		R-206-9	P-5399	P-2948-424		¥ΕR	LAY 000
CROSS REFERENCE LIST	DESIGNATION NO.	R27-R33 R13,R15,R17,R19 R21,R23,R25,R60	R2 44 86, 88, 810 R12, 857 R43-R48, 855 R49-R5 R41, 83, 82, 87, 89,	R15,R34,R30 R63 R42 R16,R16,R18,R20, R22,R24,R26,R35 R40,R58,R62	VR1 CR1,CR2	47-412,421 41-46,413-420,422	5	150			<u>-</u>	174-173			USED ON FULL NO REO'D I PER	SEVEN DIGIT DISPLAY ASSY DWG. AO82 -91617 - A000
CROS	티	~ ~	r rorm	2	4ER 1	۲. 5	-	<u></u>	~ ~·	1v£	` - '	, n	· <u>.</u>		1	.
	.01 MF 25V	1.2K 1/4W 5X 1.5K 1/4W 5X	2,2K 1/4W 5X 9,1K 1/4W 5X 20K 1/4W 5X 39K 1/4W 5X 100K 1/4W 5X	150K 1/4M 5X 240K 1/4W 5X 300K 1/4M 5X	143045A/110V ZENER 184148	2NS401 MPS-A42	MC14543	7 DIGIT DISPLAY DS1 MTG. HDW	TACK - SCREW REPLACEMENT DISPLAY MIG. TOP	DISPLAY ATG. BOTTOM PRESSURE SENSITIVE TAPE	BUMPER	TEST LOOPS	7 DIGIT DISPLAY		NALD MARTHE	18 63 83
				- KEY - PIN14											PROJECT ENG. D. MACDONALD	претод на 12 (3-83)
		1 41 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	02			 DO:		<u>.</u> .		000	P.C. ₽.C.				[ <u>¥]</u>	
		424041 [14.6]		ر امال الأطالاد		_ []    	ط		12 E3092 29		PC BD A8Y -7 DIGIT A082-91617-A000	- 051				
		<u> </u>									<b>o</b> -	_				
	DESCRIPTION 144146	1M3045A/10V ZENER MPS-A42 2M5401	MPS-A42 2.45401 MC(4643 MC(4643	DISPLAT ASST 10 PIN WAFER KK-156 (2) TEST LOOPS	7 DIGIT DISPLAY PCB BUMPER											
DESIGNATION LIST	DESIGNATION NO.	4 R 1 B 1 - B 6 B 7 - B 1 2	413-420 421 422 Ui	DSI JI TPI-TP3												
DESIGNAT	DESCRIPTION .01 MF 25V	.01 MF 500V 100K OHM 1/4W 5X 2.2K OHM 1/4W 5X	100K OHM 1/4W 5K 2.2K OHM 1/4W 5K 2.2K OHM 1/4W 5K 100K OHM 1/4W 5K 100K OHM 1/4W 5K 100K OHM 1/4W 5K	2.2x OHM 1/4W 5X 100x OHM 1/4W 5X 2.2x OHM 1/4W 5X 3.0x OHM 1/4W 5X 1.5x OHM 1/4W 5X	300K OHM 1/4W 5X 1.5K OHM 1/4W 5X 300K OHM 1/4W 5X	1.5K OHR 1/4M 5X 300K OHM 1/4W 5X 1.5K OHR 1/4W 5X	300K OHM 1/4W 5X 1.5K OHM 1/4W 5X	300K OHM 1/4M 5X 1.5K OHM 1/4W 5X 300K OHM 1/4W 5X	1,2k OHR 1/4W 5X 100k OHR 1/4W 5X 300k OHR 1/4W 5X	39K OHM 174M 5K 24DK OHM 174W 5K 9.1K OHM 174W 5K 20K OHM 174W 5K	9.1K OHM 1/4W 5X 100K OHM 1/4W 5X 2.2K OHM 1/4W 5X	300K OHM 1/4H 5X NOT USED	300K OHM 1/4W 5X 150K OHM 1/4W 5X			
	DESIGNATION NO.		医硫酸 医鼠鼠 医鼠鼠	0 + + + + + + + + + + + + + + + + + + +	2 2 2 2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	R19 R20 R21	R22 R23	824 825 826	R27-R33 R34 R35-R40	241 243-248 241	855 855 857	R 5 8	865 863	}		



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DESCRIPTION	6.8UF 25V TANT.	7DE 50V CE	111F 50V	- 3	- >	٠ د	. 2	IF 50V	>	.01UF 50V CER.	>	>	OPF 1KV	204	<u> </u>	.05UF IBV CEK.	A JUPT INV CENT	₹	λ	34	N C	500	χ	50V CER.	Č.	7K 1/4	X 1/4W 5X	×:	7. TAY 1. O	9K 1/4W 5	OHW.	<b>₩</b>	1/4W	OK 1/4W	/4×	X 1/4W 5	5K 1/4	Ξ:	14 / 4 H	##/- WED	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1/4H 1/4W	E A	C 1/4W 5K	82 OHM 1W 10%
DESIGNATION	7	:	3,3	70	CS	<b>9</b>	۲۵ 6		20.00	C12 C13	4	015,016	C17 - C23	C24 - C30	C31 - C36	C37	C38 - C41	S 50	24.0	55.	, i	1		OP1 - CP16		R2	R3	<b>R4</b>	R5	92 [	<u>}</u> 8	2 %	B10.R11	R12,R13	R14,	R15	R16	R17	R18	R19	0	R21 - R25	R24	K25	R27



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ROAR	8	903
6803 CONTROL	A084-91786-C000	M051-00C53-C003

DESIGNATION LIST

6803 CONTROL BOARD A084-91786-C000 MD51-00C53-C003 (Page 3 of 4)

DESIGNATION LIST

R28 R30 R31			
<b>5</b> • • •	270 OHM 1/4W 5%	R165 - R168	120 OHM 1/4W 5K
0 == (	IX 1/4W 5%	R169 - R172	330 OHM 1/4W 5K
	10K 1/4W 5K	R173 - R187	2K 1/4W 5S
	15K 1/4W 5%	R188 - R190	1.2K 1/4W 5\$
	1K 1/4W 5K	R191 - R193	120 OHM 1/4W 5%
	10K 1/4W 5%	R194 - R196	330 OHM 1/4W 5K
R34	15K 1/4W 5K	R197 - R226	2K 1/4W 5%
R35	3,3K 1/4W 5K	R227, R228	1.2K 1/4W 55
R43	4.7K 1/4W 5%	R229	56K 1/4W 5%
1 - R50	1.2X 1/4W 5K	R230	1.2K 1/4W 5\$
- R58	3.3K 1/4W 5%	R231 - R234	330 OHM 1/4W 5%
- R61	1,2% 1/4% 5%	R235	3.3K 1/4W 58
}	56K 1/4W 5%	8236	1.2K 1/4W 58
	1.2K 1/4W 5K	10	1N958B
	56K 1/4M 56	n2	1N4606
- 10	1 OK 1/412 RE	100	184148
	# 1 T 7 T 7 T 1 T 1 T 1 T 1 T 1 T 1 T 1 T	3 6	INAKOK
0.	XC #4/1 VOC *	20,20	114149
	XC X4/1 XZ*-1	2 2 2	24 40
<b>.</b>	36K 1/4W 38	0,708	INABUS
•	1.2K 1/4W 5K	810 - 60	104143
_	56K 1/4W 5K	019 - 038	1N4004
I - R76	1.2K 1/4W 5K	039	1N4 148
	270K 1/4W 5K	10	2N5305
1 - R82	1.2K 1/4W 5K	05	2N3904
R83	110 OHM 1/4W 5K	03	2N4403
R84	3.9K 1/4W 5%	Z	2N3904
	120 OHM 1/4W 5K	05	2N4403
	3.9K 1/4W 5K	8	2N3904
R87	120 OHM 1/4W 5K	07 - 022	SE9302
	3.9K 1/4W 5K	023 - 033	2N5060
	120 OHM 1/4W 5%	034 - 036	MCR 106-1
	3.9K 1/4W 5%	037	2N5060
168	120 OHM 1/4W 5%	038 - 040	SE9302
- R95	330 OHM 1/4W 5K	041 - 050	2N5060
- R104	470 OHM 1/4W 5%	051 - 053	MCR 106-1
R105 - R119	1.2K 1/4W 5%	054 - 064	2N5060
R121	120 OHM 1/4W 5K	065 - 068	MCR 106-1
2	1.2K 1/4W 5K	040,690	2N5060
R123	2K 1/4W 5%	. 10	6803
4	3.3K 1/4W 5\$	70	6116 RAM
5 - R132	56K 1/4W 5K	US	74HCT245
RI33 - RI35	1,2K 1/4W 5%	90	74LS373
6 - R138	120 OHM 1/4W 5K	90,70	6821
9 - R141	330 OHM 1/4W 5\$	60	74LS10
2 - R145	3.3K 1/4W 5K	010	74LS04
6 - R150	1.2K 1/4W 5K	110	4011
R151 - R155	120 OHM 1/4W 5%	012	4584
R156 = R160	33 OHM 1/4W 56	013	4502
0161 = 0164	1 20 Cuts 1/Au 56	950	7415154

DESIGNATION LIST

6803 CONTROL BOARD A084-91786-CO00 M051-00C53-CO03 (Page 1 of 3)

LIST
ERENCE
S REF
CROS

PART NOS.	0360-00800-0052	0360-00800-0027	0360-00800-0001	***************************************	5000-0000-0050	0360-00800-0012		0365-00800-0014			0360-00800-0008	0360-00800-0048	0360-00800-0022	1005-0000-005	100E-00005-0033	100E-00005-0034	1006-00005-0035			1005-00005-0044				_	100E-00005-0054	100E-00005-0056	100E-00005-0057	100E=00003=0039	1006-0000-1006	76	R122		<b>u</b>	100E-00005-0065	100E-00005-0068	10000	100E-00005-0071				1005-00003-0062	
DESIGNATION NO.	C2. C3	67	C24-C30, C57-C71		C17-C23, C31-C36, C30-C41, C48-C56, C91	C44-C47, C73-C87	C43	C6, C9, C10, C12, C13	015, 016, C42, CFI-CF	. CO.	C5, C14		800	- 13	λ œ	883	R24, R85, R87, R89,	R91, R121, R136-R138,	R151-R155, R165-R168,	R191-R193	R28	R9Z-R93, R139-R141,	R194-R196 R231-R234	R96-R104	R1	R25	R19	R18	R3, R29, R32	R44-R50, R59-R01, R02, P64-R51-R56	R78-R82, R105-R119, F	R133-R135, R146-R150,	R161-R164, R188-R190	R227, R228, R230, R2	R123 R173-R187	R197-R226	R2, R6	R17	R21-R25, R55, R51-R50 R124, R142-R145, R235	R84, R86, R88, R90	R36-R43	KIO.
OTY.	·		25		27	19	-	24			- 7	_					- 10	-			- ;	23		ō		_	_	-	m	9					~ 4	) F	2	-	<del>6</del>	4	· 60 ·	-
DESCRIPTION	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4754 50V CER	390pf 50V CER.		470pf 1KV CER.	COO I TKV CER.	ODEN TRY CER.		•	.05ut 16V CEK.	4.7 14 25V TANT	6.8uf 25V TANT	470uf 16V ELEC	470ut 25V ELEC	82 OHM 1/4W 5%	#0 ##/- EEO OO!	SC EA/L MIND OLL	47 HT/1 WHO 071			270 OHM 1/4W 58	330 OHM 1/4W 5%		34 WAY 1 MMO OCA	MY/ MHO	0HM 1/4M		910 OHM 1/4W 5K	1K 1/4W 5S	1.2K 1/4W 5%				1	1.5% 1/4% 5%	ZK 1/4M 2B	2.7K 1/4W 5\$	3K 1/4W 5K	3.3K 1/4% 5%	22 WA/1 NO E	A. 75 . 75 . 4	5.6 1/4W 5%
DESCRIPTION		45148	CASUBI 3.580 MH7 CRYSTAL	LED GREEN	TEST POINTS	SMITCH P.B.		ZERO OHM RES. JUMPER	ZERO OHM RES. JUMPER	ZERO OHM RES. JUMPER	ZERO OHM RES. JUMPER	AD PIN IC SOCKET	28 PIN IC SOCKET	24 PIN IC SOCKET	FERRITE BEAD	.045 50.	025 50.	14 = .025 50. PINS	.025 50.	S	80.	045 SO.	045 SO.	ŧ	.02 500		- 045 50.	-WRAP	P.C. BOARD													
DESIGNATION		•	U18 - U20	, LU -	TP1 - TP7	SWI	BATT-1	JWZ	9.6	JWB	JW10	K)	XU2, XU3	XIIX	FB1 - FB4		JZ	<b>E</b>	<u>ब</u> र स	ें द	25	18	65	010		312	513	D/O BATT=1	6803 CONTROL BD.													

6803 CONTROL BOARD A084-91786-C000 M051-00C53-C003 (Page 2 of 3)

0304-00804-0010 0Q17-00042-0622 A080-91786-C000

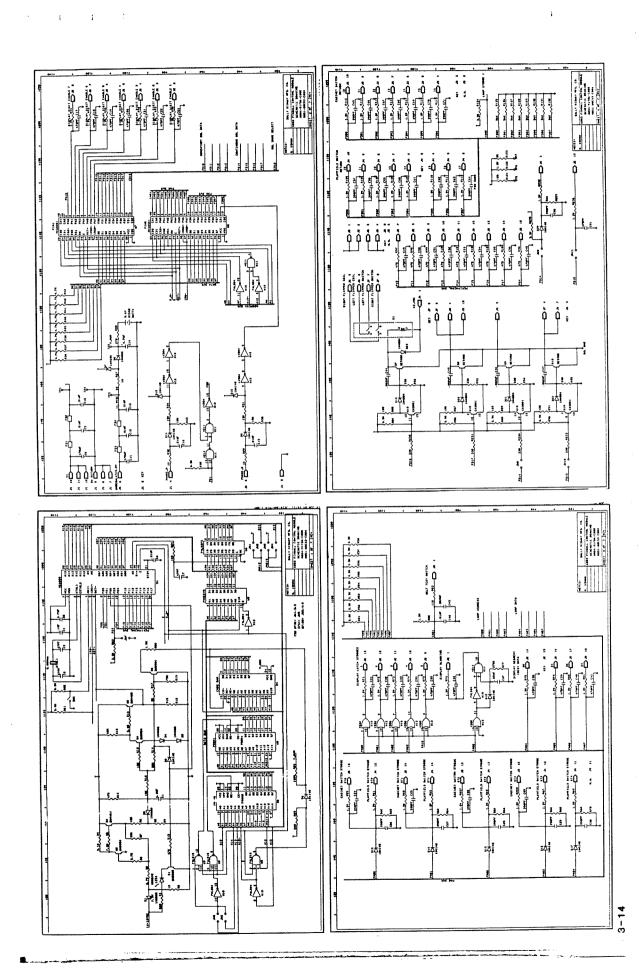
12, 13, 14, 15, 110, 0
11, 12, 13
11, 16, 17, 18, 19, 114 0
P/0 BATT-1
6803 CONTROL BOARD

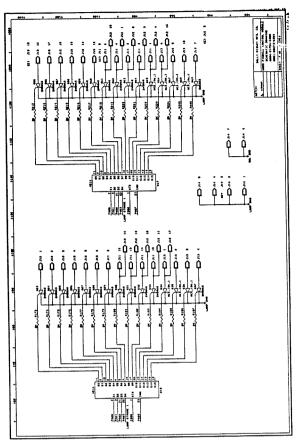
DESIGNATION NO.

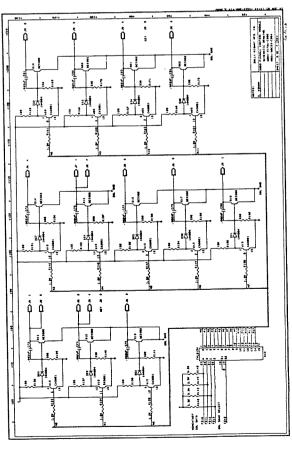
PART NOS. 0304-00804-0009

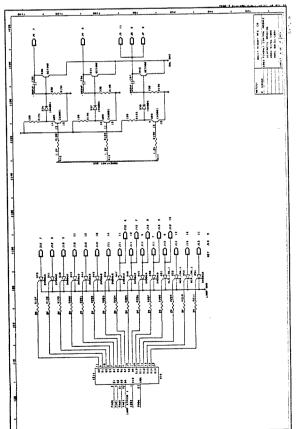
6803 CONTROL BOARD A084-91786-C000 M051-000C53-C003 (Page 3 of 3)

	!			TORUGE CONTRACTOR	Total
CROSS REFERENCE LIST	IST			CROSS REFERENCE L	
DESCRIPTION	917.	DESIGNATION NO.	PART NOS.	DESCRIPTION	Ž
2 / / v	-	25.55	100E-00005-0085	.025 SQ. PINS	123
0.1 1/4# UN	-		100E-00005-0087		,
1/4×	4		100E-00005-0088	.045 SQ. PINS	4.
1/4W	2	R31, R34	100E-00005-0092	TY-WRAP	
1/4W	- (		100E-00003-0-02	P.C. BOARD	•
1/4×	7:	DES DES DES PER	100F=00005-0105		
56K 1/4W 5%	4	5-R132,			
A2K 1/4W 54			100E-00005-0107		
3000	_	R14	100E-00005-0112		
# 1 # 1 / YOU		R26	100E-00005-0115		
AU 34/1 70/0	-	R77	100E-00005-0126		
82 OHM 1W 10\$	-	R27	100E-00007-0014		
1		ā	1036-00001-0002		
IN958B ZENER	- 6	010	1035-00003-0005		
N4004	0.4	D3 06 09-018, 039	103E-00002-0005		
N4 148		05.07.	103E-00002-0006		
34.3004	J , FC	04, 06	104E-00001-0006		
10000	· ~		104 E-00002-0006		
2N5060	35	023-033, 037, 041-050,	104E-00015-0001		
0000	i.	-064			
2015405		10	104E-00007-0003		
MCR 106-1	10	034-036, 051-053	0360-00802-0009		
		065-068			
SE9302	19	07-022, 038-040	0360-00802-0008		
4011		110	0360-00803-0010		
4502	_	. 013	0360-00803-0005		
45148	m	015-017	0360-00803-0013		
4584		U12	0066-090BX-XXUX		
6116 RAM	-	. 04	0365-00803-0015		
6803 MPU	-	In.	0360-00803-0048		
6821 PIA	7	U7, U8	0360-00803-0017		
741504	-	010	0415-00805-0010		
74LS10	_	60	UA89-UU8U3-UUU/		
75LS154	-	<b>★</b> □	0360=00803=0024		
74HCT245	- •	60	0.489=00803=0006		
74LS373 CA3081	- m	06 U18-U20	0360-00803-0007		
ATOVOO PUN COOK	-		109E-00001-0003		
3.380 BH2 CR1310		LED 1	0017-00007-0131		
TEST POINTS	7	TP1-TP7	0017-00007-0131		
SWITCH P.B.	-	SW1	0017-00032-0038		
BATTERY 3.6V		BATT-1	0017-00005-0172		
	JUMPER 5	JWZ, JW4, JW6, JW8,	117E-00001-0001		
RELAY 48VDC		2 X X	114E-00001-0011		
48 BIN 1:6: SBEKET	ET 2	šuž; šuš, <sup>vuo</sup>	118E-88881-8810		
24 PIN I.C. SOCKET	ET 1	×U4	110E-00001-0007		
FERRITE BEAD	4	FB1-FB4	0316-00804-0002		









8 8 - C WIRE CODE CONNECTOR PIN 

BEAT THE CLOCK LAMP DRIVER LOCATIONS

CONHECTOR PIN

THE 28

311-2

311-2

311-1

THE 28

AA
312-1

THE 28

AA
312-1

THE 28

AA
312-1

THE 68

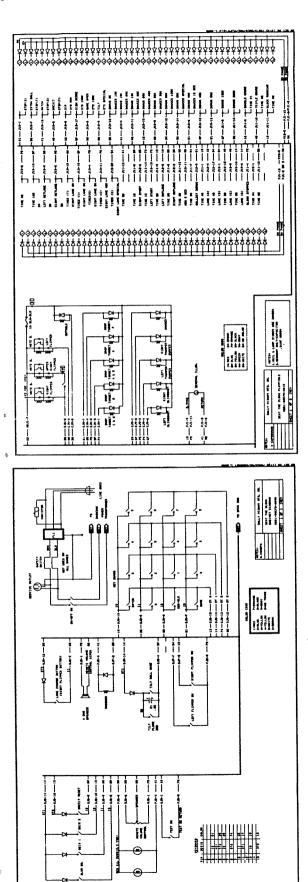
AA
312-1

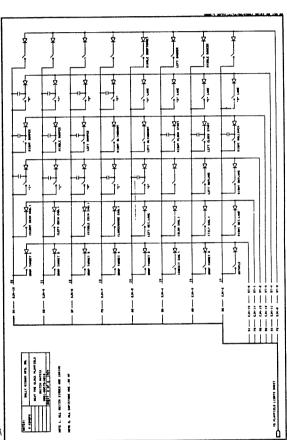
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	VIRE CODE	4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
DRIVER LOCATIONS	COIL	KINGKER KI FLIPPER RELAY LEFT SHUPER LEFT SHUCE LEFT SHUCE OUTNOLE BUMPER RIGHT SHUCER RIGHT SHU
BEAT THE CLOCK SOLENOID DRIVER LOCATIONS	CONNECTOR/PIN	08 CONTROL 80. 08-13-13-13-13-13-13-13-13-13-13-13-13-13-
BEAT	TRANSISTOR	048 013 018 018 019 019 014

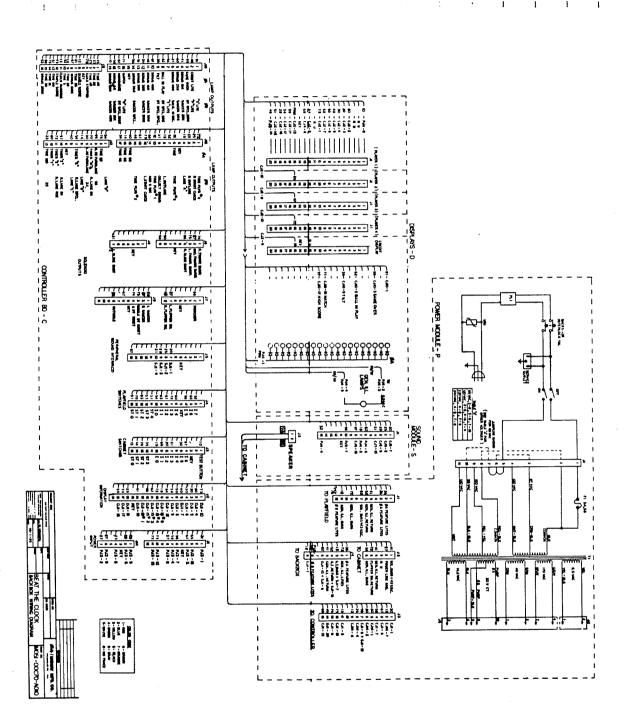
1-RED -8 - 6-880-W -8R - 6-880-W - 8-3 - 8-10 - 8-10 - 8-3 - 8-10	1-FIRST NUMBER-BODY COLOR 2-SECOND NUMBER-TRACER COLOR EXAMPLE: 58 - WHITE-RED 51 - WHITE-RED	
-46-46	EXA EXA	
	-R- 6-BROWN -BLU- 7-ORANGE	#FED-R- 6-BROUN #BLE - 10- 7-DRANGE GREUN - 9-BLACK 9-CRACK FILON - 9-CRACK FILTRI - WHITE - WHITE FILTRI NUMBER-178-CR COLO MARKE: 18 - WHITE FILTRI - WHITE FILTI - WHITE FILTRI - WHITE

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3-17

## RALLY/MIDWAY'S BEAT THE CLOCK PIN #C70

## ROM/EPROM PART NUMBERS

UNFROGRAMMED CONTROL BOARD A084-91786-C000 PROGRAMMED CONTROL BOARD A084-91786-AC70

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POS.	MIDWAY PART NUMBER
U3	0C70-00803-0005

JUMPERS	IN	QUT
JW1		**
JW2	**	
JW3		**
JW4	**	
JW5		**
JW6	**	
JW7		**
JW8	**	
JM9		**
JW10	**	
JW11		**

UNPROGRAMMED SOUAWK & TALK A084-91625-A000 PROGRAMMED SOUAWK & TALK A084-91625-AC70

MIDWAY PART NUMBER
0C70-00803-0002
0070-00803-0003
0070-00803-0004
0070-00803-0001

JUMPERS	IN	OUT
Α		**
R		**
С	**	
D	**	
E	**	
F		**
G	**	
Н	**	
J		**
K		**
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M051-00C70-R009	REVISIONS
11-07-85	RELEASE FOR PRODUCTION

