BALLY ALLEY AND BALLY LANE
TROUBLE SHOOTING GUIDE

FUSE DESCRIPTION

1. Line Fuse: 5 Amp. - Located lower, left-hand corner of Backboard.

---- Bank of three (3) fuses located to right of power transformer.

2. 3 Amp. Top two (2) fuses on bank are for +5 volt logic supply.
3. 3 Amp. They are connected to two (2) diodes on heat sink. If one (1) fuse blows, game will still play but will be very sensitive to line voltage. Game will not play at all if both fuses are blown.

4. 3 Amp.: 50 volt A.C. for coin entry. If fuse blows, game will not take coins.

---- Fuses #5 & 6 located above power transformer.

5. 15 Amp., Type 4AG, Left-Hand Fuse: Connected to power supply transistor, on heat sink, for Players 1 & 2 Scoreboard. If fuse blows, game will not play at all.

6. 15 Amp., Type 4AG, Right-Hand Fuse: Connected to power supply transistor, on heat sink, for Players 3 & 4 Scoreboard. If fuse blows, all displays on the playglass will be out, except for the ball. The coin entry system will still take coins.

---- Fuses #7 & 8 located on Heat Sink.

7. 1/2 Amp., Top Fuse: Connected to drive circuit for power transistor for Players 1 & 2 Scoreboard. If fuse blows, shuts off power to Players 1 & 2 Scoreboard, which shuts off all displays operated by the board. See section on Players 1 & 2 Scoreboard for list of displays operated by the board.

8. 1/2 Amp., Bottom Fuse: Connected to drive circuit for power transistor for Players 3 & 4 Scoreboard. If fuse blows, shuts off power to Players 3 & 4 Scoreboard. See section on Players 3 & 4 Scoreboard for list of displays operated by the board.

8. (Continued)...

NOTE: Use only 1/2 Amp., 'fast-blo' fuses. Using a bigger fuse or a 'slo-blo' fuse could destroy power transistor.

---- Fuses located on Control Board

9. 1 Amp., Top Fuse: 15 volt D.C. internal power supply for MOS logic. If fuse blows, game will stop playing, but displays will stay on. Coin Entry will still take coins, but give no credits.

10. 1 Amp.: 15 volt D.C. supply to Ball Display. If fuse blows, Coin Entry shuts off. Game will still play except no ball on alley.

11. 1 Amp.: +12 volt supply for internal use and Receiver. If fuse blows, coin entry is on, all displays are on, including ball. Game will not play from Remote.

12. 1 Amp., Bottom Fuse: -12 volt supply for internal use and Receiver. If fuse blows, coin entry is on, all diplays are on. Game will not play from Remote.

ELECTRONIC BOARD DESCRIPTIONS

Control Board: This is the brain of the game. As the name implies, it controls the operation of the game. All the action for the game is generated by the Control Board, then sent to the two (2) Scoreboards to be displayed on the Playglass.

Scoreboard - Players 1 & 2: This board takes the information generated by the Control Board, decodes it and sends it to the correct display lamps.

This board drives the following displays:

a) Players 1 & 2 score
b) Frame number
c) Pins
d) Back-up ball
e) Hook ball
f) Vertical position of ball on alley
g) Players up

Scoreboard - Players 3 & 4: This board operates the same way as Players 1 & 2 board, except for the displays it drives.

This board drives the following displays:

a) Players 3 & 4 score
b) Credits
c) Match number
d) Ball-up number
e) Game over
f) Insert coins now
g) Press "Players Up" button now
h) Horizontal position of ball on alley
i) S.C.R. for coin circuit and S.C.R. for half-power circuit are also on this board.

NOTE: Scoreboards - Players 1 & 2 and Players 3 & 4 are NOT INTERCHANGABLE.

Transmitter: Remote Unit allows game to be played anywhere up to about 30 feet away.

Receiver: Takes the signal transmitted by the remote unit, decodes it and sends the information to the Control Board.

TROUBLE SHOOTING SECTION

PROBLEM	CHECK LIST
1. No lights on.	a) Check Fuses (see Fuse List). b) Check all Plugs & terminations for tightness. c) Exchange Control Board. d) Exchange Heat Sink Assembly.
2. Only General Illumination lights on, no Numerals, no Pins, etc. (Gen. Ill. includes "ball", "beat", "credit", etc.).	a) Check Fuses (see Fuse List). b) Check Plugs for tightness. c) Check A.C. supply voltage (min. of 95 volts). d) Exchange Control Board.
3. Players 1 & 2 scores lite up, Players 3 & 4 scores don't or vice versa.	a) Check Fuse (see Fuse List). b) Check that Plugs are connected. c) Check that Ground Wire is terminated tightly on offending Scoreboard. d) Exchange offending Scoreboard. e) Exchange Control Board. f) Exchange Heat Sink Assembly.
4. No Ball Display on alley.	a) Check Fuses on Control Board (see Fuse List). b) Exchange Control Board.
5. A horizontal row of lights for the Ball Action on the alley is out.	a) Exchange Players 1 & 2 Scoreboard.
6. A vertical row of lights for the Ball Action on the alley is out.	a) Check that small cables are connected in lamp section. b) Exchange Players 3 & 4 Scoreboard.

NOTE: On Problems 5 & 6 - If only a couple of the lamps are out, check lamps and connections to lamps.

TROUBLE SHOOTING SECTION (Continued)...

PROBLEM	CHECK LIST
7. Game is stopped, will not play. All Displays are on.	a) Unplug A.C. line cord, wait 10-15 seconds, plug back in. b) Exchange Control Board.
8. Takes coins but gives no credit.	a) Check Control Board fuses (see Fuse List). b) Exchange Control Board.
9. Will not take coins.	a) Check coin acceptors. b) Check fuse #4, 10 - See fuse list c) Exchange control board. d) Exchange score board, Players 3 & 4
10. "Score to beat" or "Match" feature not working properly.	a) Check small cables in lamp section. b) Exchange control board.
11. Game stays on half power or full power all the time.	a) Exchange score board, Players 3 & 4 b) Exchange control board. c) Exchange heat sink assembly.
12. While playing game, score numerals end up on 8 (eight) because after a lamp turns on it fails to turn off, and the bowling pins never go out.	a) Exchange heat sink assembly. b) Exchange control board.
13. Game will not work from remote transmitter.	a) Check fuses on control board- see fuse list. b) Make sure receiver plug going to control board is plugged in correctly. Brown wire on plug should be down. c) Make sure antenna is plugged into receiver. d) If there is a T.V. game nearby, hold transmitter next to it and push one of the remote buttons. If transmitter is working it should produce interference on T.V. sets. e) Check battery voltage in transmitter should be no less than 8.0 volts. f) Change transmitter & receiver. Make sure new transmitter and receiver are on same channel. They do not have to be on same channel as old set

TROUBLE SHOOTING SECTION (Continued)...

NOTE: If there is trouble playing the game at a distance beyond about twenty (20) feet, pull the antenna wire from around the edge of the back-board and extend it out to help pick up more signal.

14.	"Game over" and "Bally Alley" lights do not work properly.	a) Check small cables in lamp section. b) Replace scoreboard, players 3 & 4. c) Check data cell and S.C.R. located by lamps. Data cell imput should be 6 V.D.C. for lites to be on.

NOTE: Whenever either scoreboard is replaced, reconnect the small plugs to the board that are located in the lamp section, front side, of display board.

GENERAL INFORMATION SECTION

I. To remove aluminum frame from backboard
- a) Disconnect heavy wires marked A, B, D, E, H and cable plugs.
- b) Lift aluminum frame up off the hinges.

II. To test all numeral lamps:
- a) If there are no credits on credit readout, put one on using the "test switch" located on the control board.
- b) Start a game.
- c) Play the game to get a strik or spare, so that all bowlin pins are not lit.
- d) Press "lamp test" switch located on control board. Hold the switch on and check that all the numerals on the fron glass read 8 (eight).
- e) Play the game out to check all other lamps.

III. Heat sink assembly removal:
- a) Disconnect all heavy wires marked A thru H and cable plug.
- b) Remove "L" bracket between heat sink and cross bar.
- c) Unscrew heat sink from aluminum frame.

IV. To replace heat sink :
- a) Clean aluminum frame where heat sink is to mount.
- b) Lightly cover side of heat sink to be joined to aluminum with "Wakefield Thermal Compound" or equivalent.
- c) Firmly screw heat sink to aluminum frame.
- d) Replace "L" bracket.
- e) Reconnect all wires.

INSTRUCTIONS FOR STAND ASSEMBLY

1. Insert the two legs (containing "T" nuts) of the horizontal piece into the slots on the face of the tall upright. Fasten with four 3/8' diameter hex head screws and large washers.

2. Insert the short front upright between the legs of the horizontal piece and fasten with the remaining four 3/8" diameter hex head screws and large washers.

3. Install the four leg adjusters and hex nuts.

INSTRUCTIONS FOR MOUNTING "BALLY ALLEY"

1. Set "BALLY ALLEY" display unit on the horizontal cross piece and center against the face of the tall upright. Open the display unit and feed the line cord through the left side mouse hole. Drill four holes to suit (staying clear of all electrical comp.) through the back board and the stand upright using #7 (.201) drill. Fasten with four #10 carriage bolts, washers and nuts.

2. Remove antenna from inside the door of the display unit and mount to suit, either horizontal or vertical, on the back surface of the back board in the upper right hand corner. Feed antenna lead through the open hole and connect to the receiver board.

   Take the solder lug connected to the black wire out through the same hole and fasten to the antenna bracket using the #6-32 screw and washer found on the antenna mounting bracket.

3. Insert gray 3 wire cable into the armored cable housing, clamp to back board, connect 3 wires to terminal strip, match 2 out of the 3 colors, odd color to third terminal. Feed armored cable through center mouse hole and close display unit. Feed the cable through the horizontal part of the stand and out.through the hole in the front upright.

4. Take the cash box mounting board and center it on the front upright up tight against the over hang. Drill four holes to suit (staying clear of the four "T"nuts) through the back board and the stand upright using #7 (.201) drill. Fasten with four #10 carriage bolts, washers and nuts. Bolt heads must be drawn down flush or slightly below the surface of the mounting board.

5. Feed the cable through the bushing in the back of the cash box housing and mount the housing to the back board using four #10 x 3/4" long lockwasher screws (packed in loose parts). When mounting the cash box housing to the board,lay the cable in the groove in the board.

INSTRUCTIONS FOR MOUNTING "BALLY ALLEY" (CONTINUED) . . . .

6. Clamp cable to housing shelf, trim length to suit and connect wires to terminal strip. Match two out of three colors, odd color to third terminal.

INSTRUCTIONS FOR MOUNTING REMOTE UNIT

NOTE: This unit does not have to be stationary. It may be left loose at the discretion of the operator or the location owner.

1. Remove the four rubber feet from the base of the unit revealing four predrilled mounting holes. Using the special "Service Screw Driver" located on the inside of the display unit back board, remove the ten tamper-proof screws holding the cover to the base plate.

2. Center the remote unit on the top surface of the front upright and screw down through the four holes using the four #8 x 5/8" long screws being careful not to damage the P.C. board located inside the remote unit. Reassemble the cover to the base with the ten tamper-proof screws.

INSTRUCTIONS FOR STAND ASSEMBLY

1. Insert the two legs (containing "T" nuts) of the horizontal piece into the slots on the face of the tall upright. Fasten with four 3/8" diameter hex head screws and large washers.

2. Slip front upright over the horizontal piece and snug up against the overhang. Fasten with four 3/8" diameter hex head screws and large washers.

3. Install the four leg asjusters and hex nuts.

INSTRUCTIONS FOR MOUNTING "BALLY ALLEY"

1. Set the cash box mounting board on the horizontal cross piece and center it against the face of the tall upright. Drill four holes to suit (staying clear of the four "T" nuts) through the back board and the stand upright using #7 (.201) drill. Fasten with four #10 carriage bolts, washers and nuts. Bolt heads must be drawn down flush or slightly below the surface of the mounting board.

2. Set "BALLY ALLEY" display unit on the edge of the cash box mounting board and center it against the face of the upright. Open the display unit and feed the line cord through the hole on the left side of the upright. Drill four holes to suit (staying clear of all electrical components) through the back board and the stand upright using #7 (.201) drill. Fasten with four #10 carriage bolts, washers and nuts.

3. Remove antenna from inside the door of the display unit and mount to suit, either horizontal or vertical, on the back surface of the back board in the upper right hand corner. Feed the antenna lead through the open hole and connect to the receiver board.

   Take the solder lug connected to the black wire out through the same hole and fasten to the antenna bracket using the #6-32 screw and washer found on the antenna mounting bracket.

4. Insert gray 3 wire cable into the armored cable housing. Feed the cable through the bushing in the back of the cash box housing and mount the housing to the back board using four #10 x 3/4" long lockwasher screws (packed in loose parts).

   When mounting the cash box to the board, lay the cable in the groove in the board so that it comes out the top, directly into the display unit.

   Clamp cable to housing shelf and connect the wires to the terminal strip. Match two out of the three colors, odd color to third terminal.

INSTRUCTIONS FOR MOUNTING "BALLY ALLEY" (CONTINUED) . . . .

5. Trim cable length to suit, clamp to back board of display unit and connect 3 wires to terminal strip. Match two out of three colors, odd color to the third terminal.

NOTE:

REMOTE UNIT

The above unit is not meant to be fastened down on the stand. It is suggested that this unit be set on the top surface of the horizontal piece in front of the cash box. This will allow the player to move the remote unit to a location of his choice after depositing coins in the cash box.

FO-409

Game #966 BALLY ALLEY

INSTRUCTIONS FOR WALL MOUNTING "BALLY ALLEY"

1. After choosing the proper position for wall mounting the display unit, the first step is to determine the method by which to fasten the "hanger bracket."

   This bracket is 34" long, "J" shaped in cross section with three 1/8 x 1" slots at the bottom of the "J" and has three 3/8" diameter mounting holes on 16" centers. It will be found packed in the carton with the display unit.

   Due to the wide variation of possible wall construction, the selection of mounting hardware used to hang this bracket has been left to the discretion of the installer.

2. Remove antenna from inside the door of the display unit and mount to suit, either horizontal or vertical, on the back surface of the back board in the upper right hand corner. Feed the antenna lead through the open hole and connect to the receiver board.

   Take the solder lug connected to the black wire out through the same hole and fasten to the antenna bracket using the #6-32 screw and washer found on the antenna mounting bracket.

3. Prior to hooking the display unit on the "hanger bracket," it may be an advantage in some cases to pry out , at a slight angle, the edge containing the three tabs found on the "bracket" mounted on the back surface of the display unit.

   This will be to the installers advantage if the fasteners used to mount the "hanger bracket" to the wall have an unusually high or thick head, such as lag bolts, etc.

4. After the display unit is hung, the next step is to secure it to the wall by inserting fasteners through the back board and the stand-off strip using the two 9/32" diameter holes found near the bottom of the board (2" long wood screws are packed in loose parts).

   This is done to prevent lifting or jarring the display unit upwards which might cause it to disengage from the "hanger bracket."

5. Determine the proper location for the cash box. This location is limited to approximately 12 feet away from the display unit using the three conductor cable only and approximately 8 feet away using the cable in conjunction with the flexible conduit (both found packed in loose parts).

   Take the cash box mounting board and secure to the wall again using mounting hardware to suit the wall construction. The fasteners used to mount this board must stay clear of the four "T" nuts and must be flush or slightly below the surface of the mounting board.

FO-409

Game #966 BALLY ALLEY

INSTRUCTIONS FOR WALL MOUNTING "BALLY ALLEY" (continued) . . . .

6. Insert the three wire cable into the flexible conduit. Feed the conduit through the bushing in the back of the cash box housing & mount housing to the back board using four #10 x 3/4" long lockwasher screws (packed in loose parts).

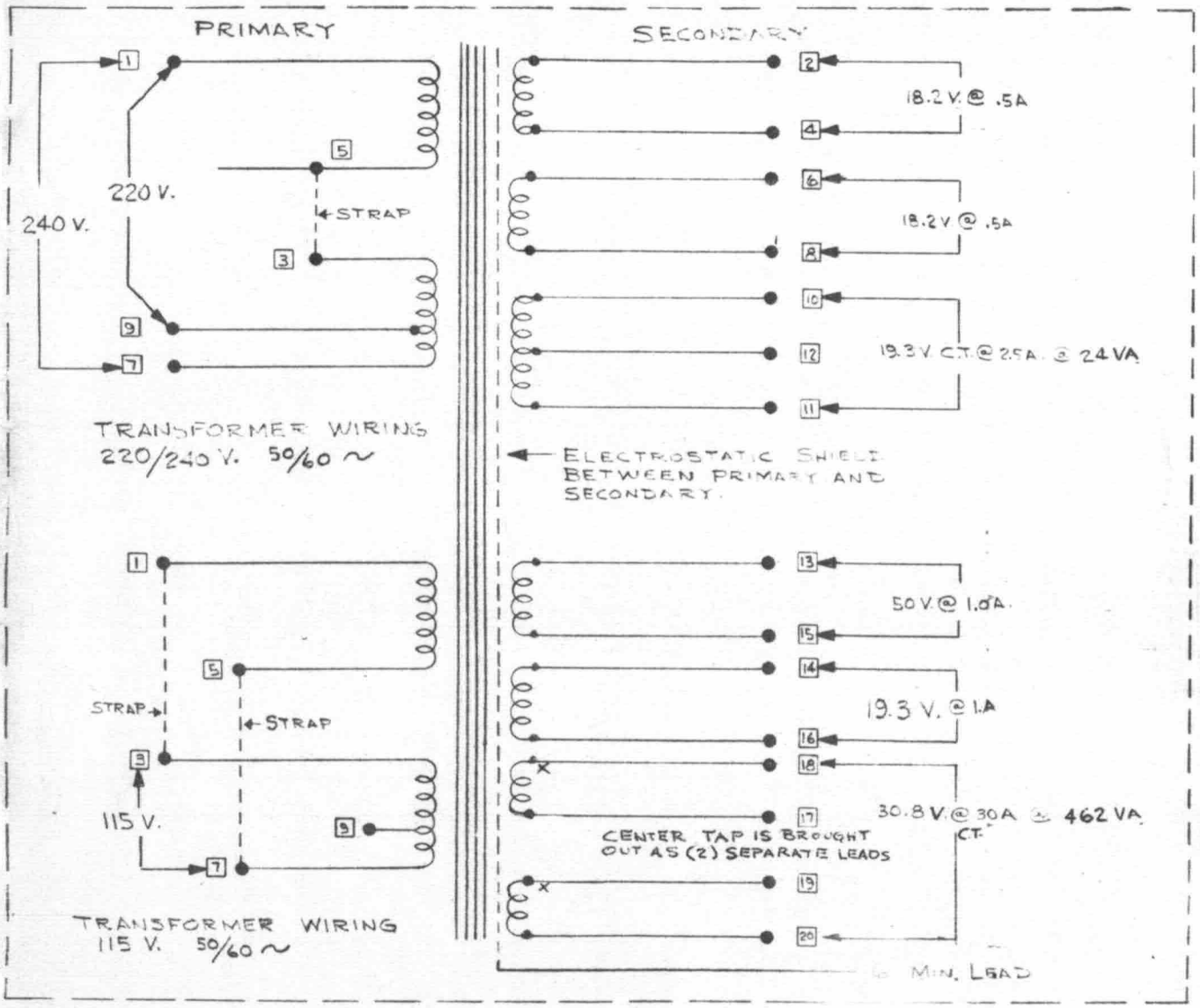
   When mounting the cash box to the board, lay the cable in the groove in the board so that it comes out either the top or bottom, whichever is best suited to the installation.

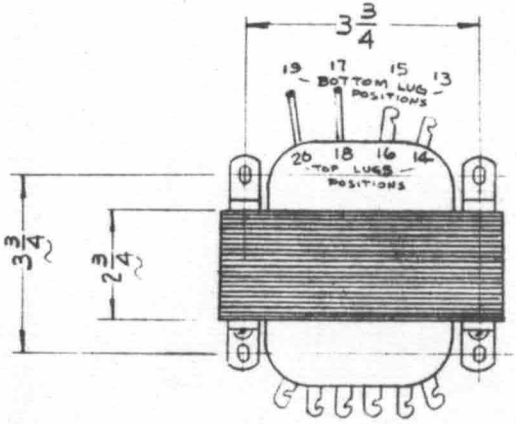
   Clamp the cable to the housing shelf and connect the wires to the terminal strip. Match two out of three colors, odd color to third terminal.

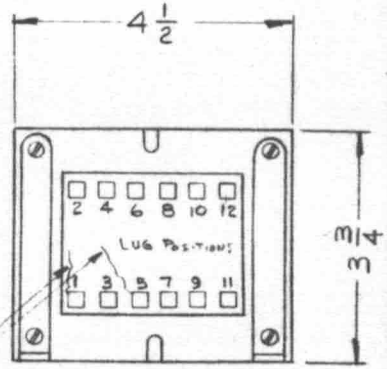
7. Run the opposite end of cable up through the groove in the center of the "display unit" back board, clamp it to the board, trim to suit and connect three wires to the terminal strip. Match two out of three colors, odd color to the third terminal.

   Bring the line cord down through the groove on the left side of the back board and the installation is completed.

P PART NO. E-122-119b



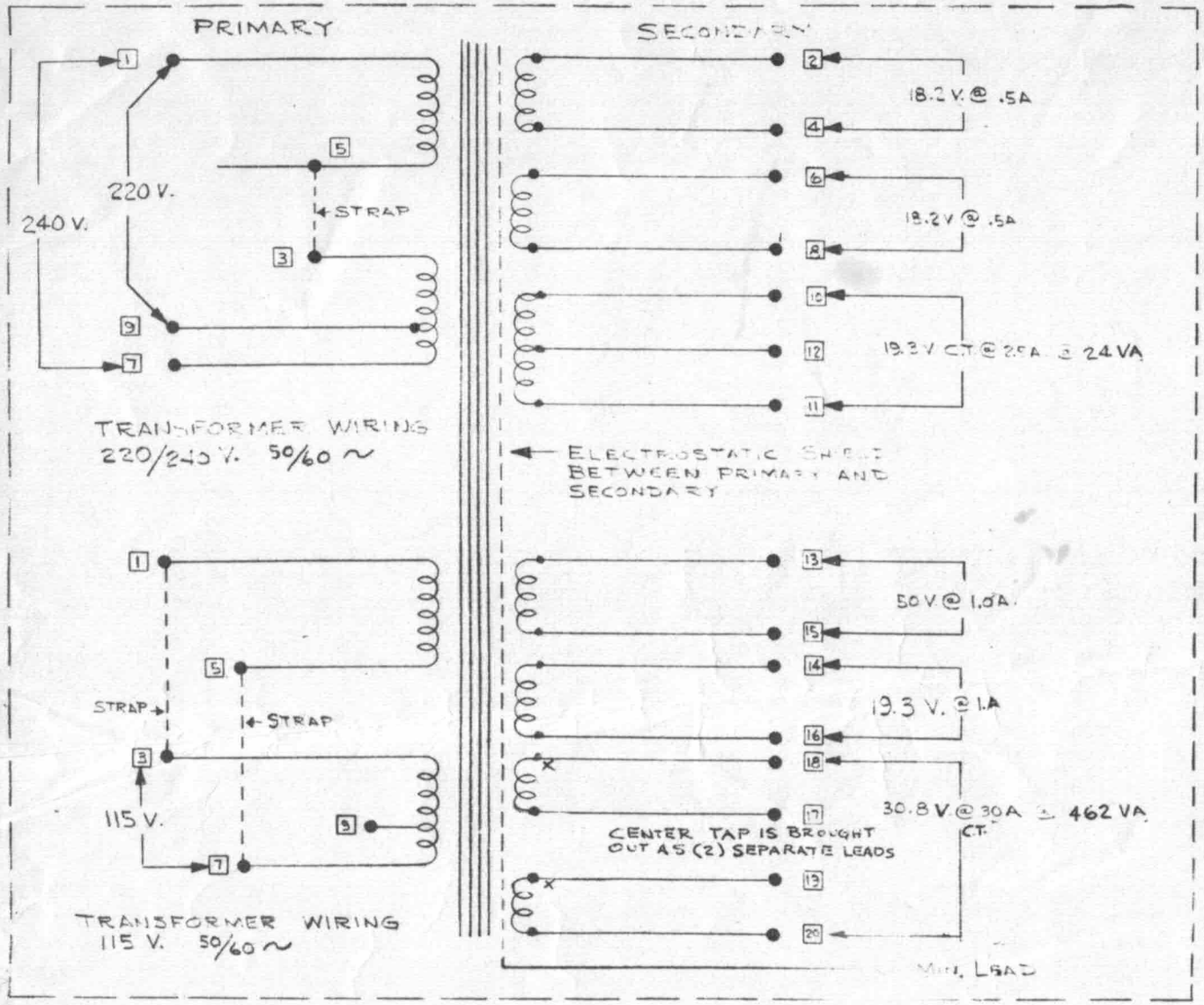


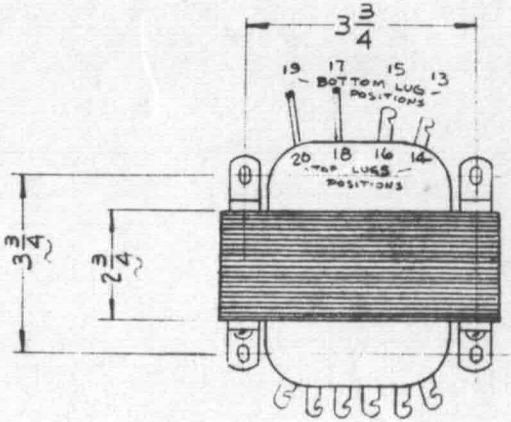


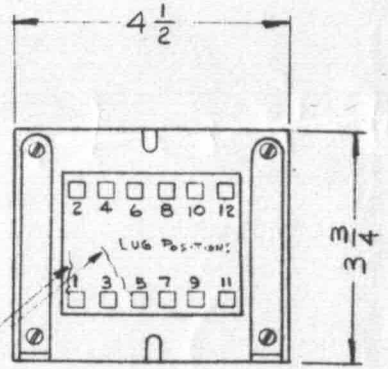
ADDITIONAL LEADS 1½ INCHES LONG TO BE FURNISHED BY SUPPLIER

NOTE: TRANSFORMERS TO BE INSPECTED 100% FOR PROPER AMP... OF TURNS: TRANSFORMER TO HAVE VARNISH IMPREGNATION.

P PART NO. E-122-119b







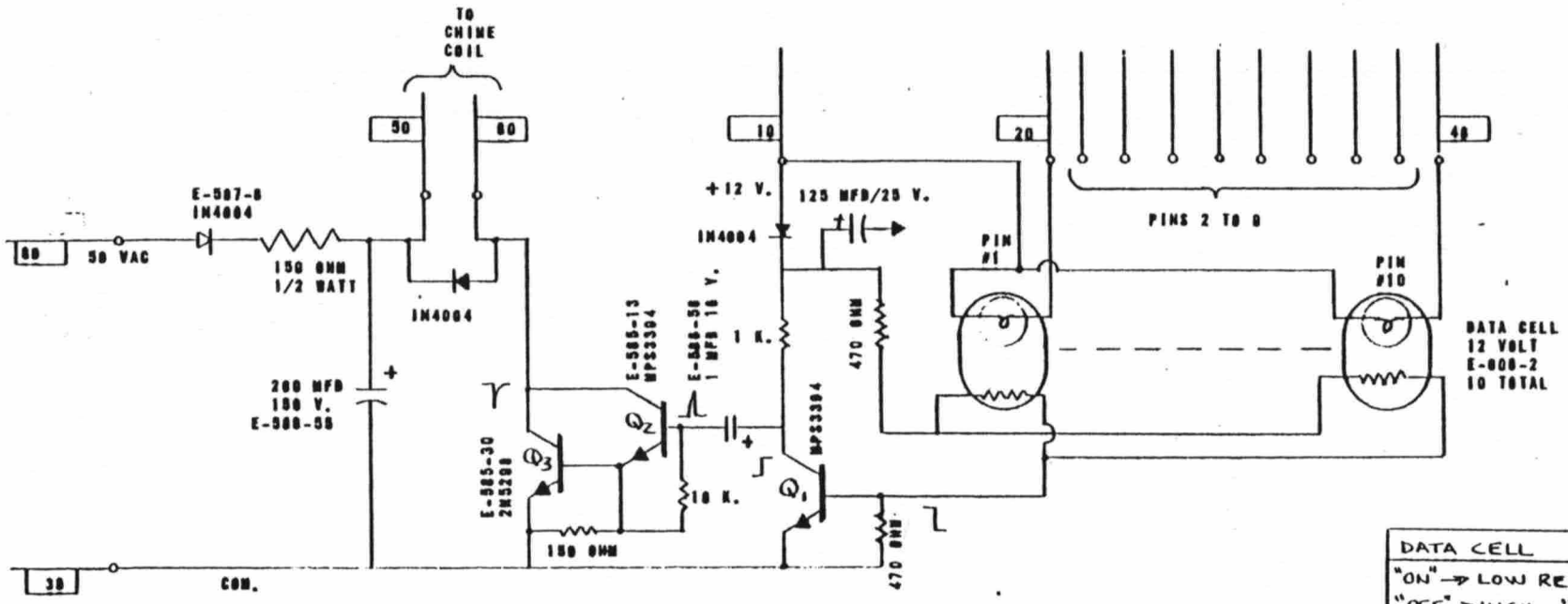
ADDITIONAL LEADS 1½ INCHES LONG TO BE FURNISHED BY SUPPLIER

NOTE: TRANSFORMERS TO BE INSPECTED 100% FOR PROPER AMOUNT OF TURNS; TRANSFORMER TO HAVE VARNISH IMPREGNATION.

L

PART NO. W-1166a

PAGE 44



DATA CELL
"ON" → LOW RESISTANCE
"OFF" → HIGH " " "

PAGE 44

NO.	LET.	CHANGE	DATE	BY	CK.
		CICUIT REVISED	5-14-74	RG	D2

REMOVE ALL BURRS

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED
FRACTIONS ± .008
DECIMALS ± .003
ANGLES ± 1/2°

DO NOT SCALE DRAWING

DR. BY RG	DATE 1-4-74
CK. BY W.P.	DATE 1-4-74
AP'D BY	DATE
AP'D BY CF	DATE 1-9-74
FINISH:	
HARDENING:	

Bally MANUFACTURING CORP.
2640 BELMONT AVENUE
CHICAGO, ILLINOIS

JAN 9 1974

966

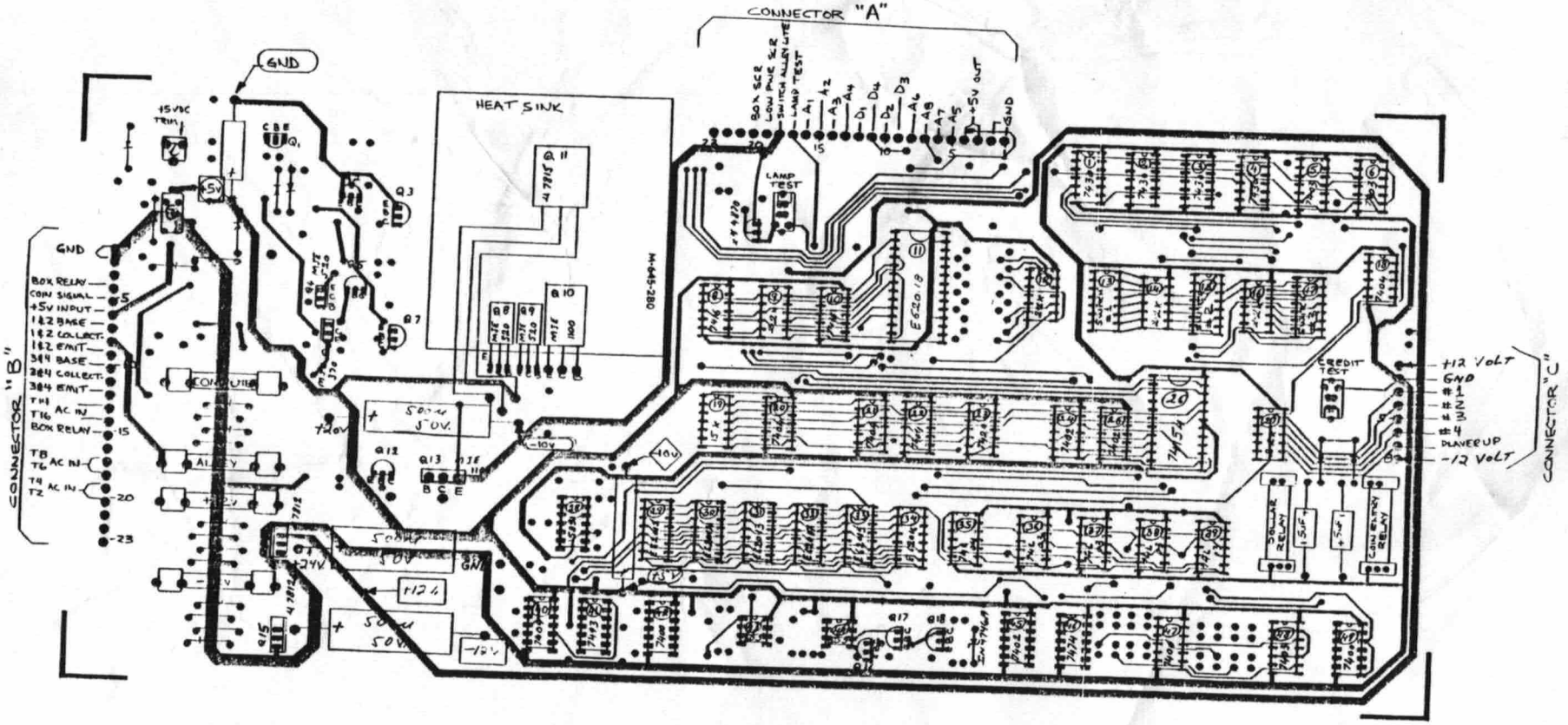
PRINT CONTROL →	PROD CONT.	PUR. DEPT.	ENG. FILE	TOOL DESIGN	COST DEPT	INC. INSP.	TOOL INSP.	MACH. INSP.		TOTAL	SCALE

NAME
STRIKE-SPARE CHIME CIRCUIT

ASSEM. NO. USED ON/W

MATERIAL

PART NO. W-1166a



CONTROL BOARD E-637
ALL VOLTAGE CHECK POINTS ARE MEASURED FROM GND.

MARCH 12, 1974

Note from former Bally Engineer Allan Reizman:
We are missing here the left half of the full page 45 schematic. The right half of page 45 is the important half as it shows the receiver inputs to the MPU. Fortunately, the individual sub circuits are documented in the full service manual.