

SERVICE TIPS

FAST AID HOT LINE: 800-323-0666
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TELEX: 253290



- MANDATORY
- ON FAILURE ONLY
- FOR YOUR INFORMATION

82-16

ATTN: SERVICE MANAGERS:

GAME: POWER SUPPLY #08-00007-001 USED ON "QIX", ALPINE SKI, WILD WESTERN,
KRAM, ELECTRIC YO YO.

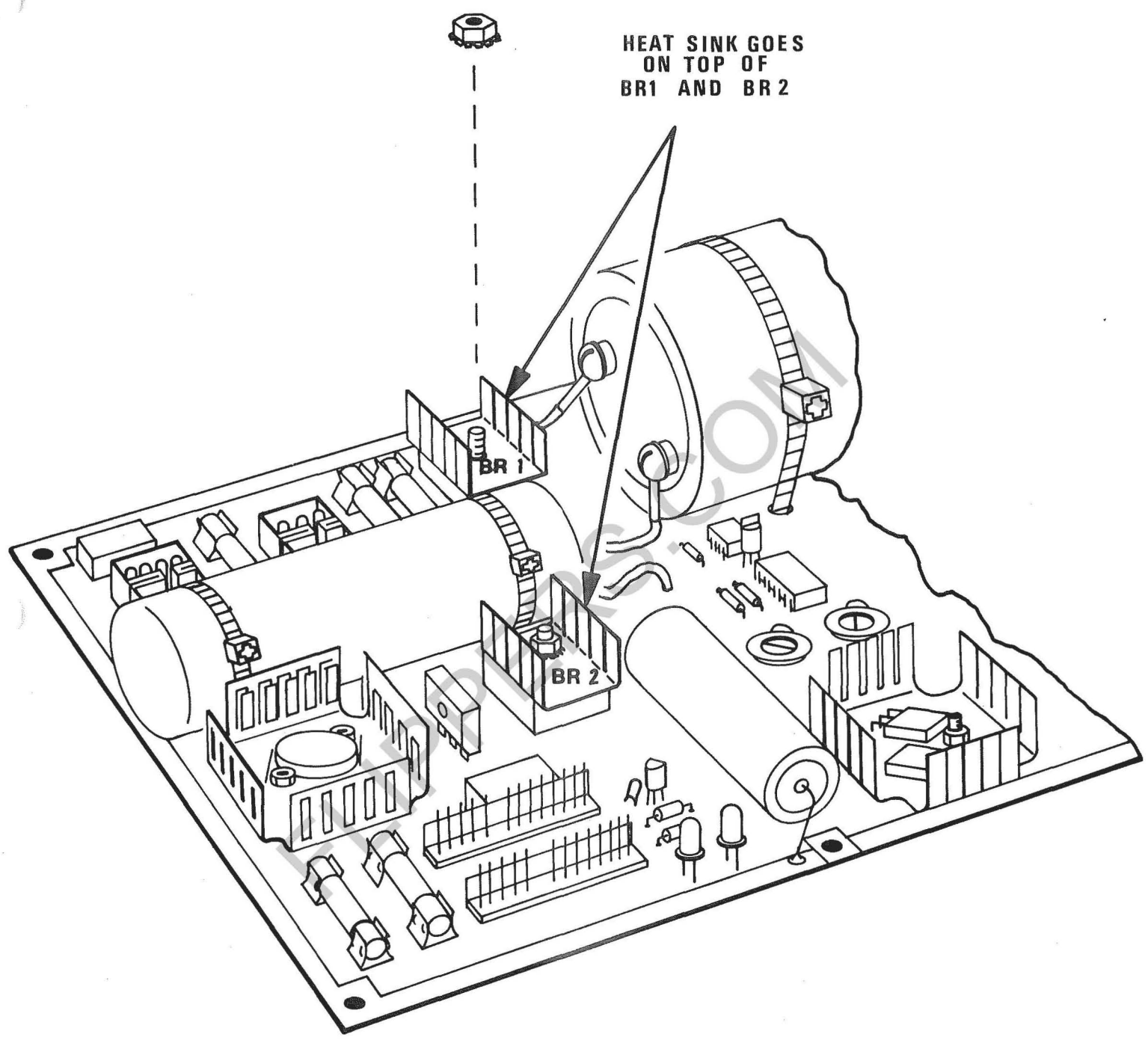
SUBJECT: BR1 AND BR2 HEATING UP TO THE EXTENT OF BREAKING DOWN INTERNALLY.

SOLUTION: ADDING HEAT SINKS ONTO BR1 AND BR2.

PARTS:	TWO	HEAT SINKS	30-00001-001
	TWO	SCREWS 6-32X1	51-02002-001
	TWO	KEPS NUTS 6-32	54-02002-001
		HEAT SINK COMPOUND	

PROCEDURE: POWER DOWN GAME, REMOVE POWER SUPPLY P.C.B. 08-00007-001
APPLY HEAT SINK COMPOUND TO THE TOP OF BR1 AND BR2 (REFER
TO FIGURE 1). PLACE A HEAT SINK ON TOP OF BR1 ALIGNING HOLES
AND MAKING SURE THAT HEAT SINK DOESN'T TOUCH ANY OTHER
COMPONENTS. FEED THE SCREW THROUGH THE ETCH SIDE OF THE
POWER SUPPLY. TIGHTEN THE NUT SNUGGLY. REPEAT PROCEDURE
FOR BR2.

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HEAT SINK GOES
ON TOP OF
BR1 AND BR 2

FIGURE 1

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82-18

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ATTN: SERVICE MANAGERS

GAME: KRAM

SUBJECT: NO HIGH SCORE TO DATE PROGRAM

SOLUTION: UPGRADE ROM REVISION

PARTS NEEDED: ONE KRAM ROM SET PART NUMBER 16-00014-000

PROCEDURE: LOOK AT THE ROM LOCATION 19 ON THE ROM I/O BOARD. IF IT IS NOT KS19 OR KR19-3 THEN A NEW ROM SET IS NEEDED. REPLACE THE ROM SET WITH THE KS ROM REVISION.

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82-20

ATTN: SERVICE MANAGERS

GAME: QIX, KRAM, THE ELECTRIC YOYO, SPACE DUNGEON

SUBJECT: SWITCH TEST

SOLUTION: THE FOLLOWING IS A SWITCH TEST PROCEDURE FOR THE ABOVE GAMES.

PROCEDURE: A LIST OF SWITCH NUMBERS THAT CORRESPOND TO A SPECIFIC SWITCH.

PARTS NEEDED: NONE

PROCEDURE: AFTER THE ELECTRONIC TEST PASSES ALL THE TESTS, THE SWITCH TEST SHOULD BE DISPLAYED ON THE SCREEN. THE FOLLOWING IS A LIST OF SWITCH NAMES, THAT WHEN PRESSED, THE CORRESPONDING NUMBER SHOULD TURN GREEN.

REMEMBER, SWITCHES 29, 30, 31, AND 32 SHOULD BE GREEN. THEY ARE USED FOR OUTPUTS.

THE SWITCHES THAT HAVE (2P) IN FRONT OF THE DISCRIPTION ARE FOR COCKTAIL TABLE SECOND PLAYER CONTROLS.

"KRAM"

<u>SWITCH NUMBER</u>	<u>DISCRIPTION</u>
1	(1P) JOYSTICK UP
2	(1P) JOYSTICK RIGHT
3	(1P) JOYSTICK DOWN
4	(1P) JOYSTICK LEFT
5	(1P) BREAK OUT
6	
7	
8	(1P) WALL
9	ADVANCE TEST (ALWAYS RED)
10	ADVANCE SUB TEST
11	SLEW UP
12	SLEW DOWN
13	LEFT COIN SWITCH
14	RIGHT COIN SWITCH
15	MIDDLE COIN SWITCH
16	TILT
33	(2P) JOYSTICK UP
34	(2P) JOYSTICK RIGHT
35	(2P) JOYSTICK DOWN
36	(2P) JOYSTICK LEFT
37	(2P) BREAK OUT
38	
39	
40	(2P) WALL

"SPACE DUNGEON"

<u>SWITCH NUMBER</u>	<u>DISCRIPTION</u>
1	(1P) (CONTROL JOYSTICK) UP
2	(1P) (CONTROL JOYSTICK) RIGHT
3	(1P) (CONTROL JOYSTICK) DOWN
4	(1P) (CONTROL JOYSTICK) LEFT
5	(1P) (FIRE JOYSTICK) UP
6	(1P) (FIRE JOYSTICK) RIGHT
7	(1P) (FIRE JOYSTICK) DOWN
8	(1P) (FIRE JOYSTICK) LEFT
9	ADVANCE TEST (ALWAYS RED)
10	ADVANCE SUB TEST
11	SLEW UP
12	SLEW DOWN
13	COIN SWITCH
14	COIN SWITCH
15	MIDDLE COIN SWITCH
16	TILT
25	(1P) SELECT
26	(2P) SELECT
33	(2P) (CONTROL JOYSTICK) UP
34	(2P) (CONTROL JOYSTICK) RIGHT
35	(2P) (CONTROL JOYSTICK) DOWN
36	(2P) (CONTROL JOYSTICK) LEFT
37	(2P) (FIRE JOYSTICK) UP
38	(2P) (FIRE JOYSTICK) RIGHT
39	(2P) (FIRE JOYSTICK) DOWN
40	(2P) (FIRE JOYSTICK) LEFT

"QIX" & "QIX" II

<u>SWITCH NUMBER</u>	<u>DISCRIPTION</u>
1	(1P) JOYSTICK UP
2	(1P) JOYSTICK RIGHT
3	(1P) JOYSTICK DOWN
4	(1P) JOYSTICK LEFT
5	(1P) SLOW DRAW
6	2 PLAYER SELECT
7	1 PLAYER SELECT
8	(1P) FAST DRAW
9	ADVANCE TEST (ALWAYS RED)
10	ADVANCE SUB TEST
11	SLEW UP
12	SLEW DOWN
13	LEFT COIN SWITCH
14	RIGHT COIN SWITCH
15	MIDDLE COIN SWITCH
16	TILT
24	WATCH DOG (SOMETIMES GREEN)
33	(2P) JOYSTICK UP
34	(2P) JOYSTICK RIGHT
35	(2P) JOYSTICK DOWN
36	(2P) JOYSTICK LEFT
37	(2P) SLOW DRAW
38	
39	
40	(2P) FAST DRAW

"THE ELECTRIC YOYO"

<u>SWITCH NUMBERS</u>	<u>DISCRIPTION</u>
1	(1P) JOYSTICK UP
2	(1P) JOYSTICK RIGHT
3	(1P) JOYSTICK DOWN
4	(1P) JOYSTICK LEFT
5	
6	(1P) SELECT
7	(2P) SELECT
8	
9	ADVANCE TEST (ALWAYS RED)
10	ADVANCE SUB TEST
11	SLEW UP
12	SLEW DOWN
13	LEFT COIN SWITCH
14	RIGHT COIN SWITCH
15	MIDDLE COIN SWITCH
16	TILT
33	(2P) JOYSTICK UP
34	(2P) JOYSTICK RIGHT
35	(2P) JOYSTICK DOWN
36	(2P) JOYSTICK LEFT

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82-22

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ATTN: SERVICE MANAGERS

GAME: KRAM, THE ELECTRIC YOYO, SPACE DUNGEON

SUBJECT: COIN DOOR PROCESSOR CABLE CAUTION.

SOLUTION: BE AWARE THAT THE CABLES ARE NOT KEYED.

PROCEDURE: WHEN REPLACING THE COIN DOOR PROCESSOR BOARD, MAKE SURE THAT THE HEAT SINK IS TOWARD THE BOTTOM OF THE CABINET. CONNECT THE CABLE THAT IS ATTACHED TO THE ROM I/O BOARD, TO THE CONNECTOR AT THE BOTTOM OF THE BOARD AND THEN CONNECT THE CABLE FROM THE COIN DOOR TO THE CONNECTOR ON TOP OF THE BOARD.

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83-5

ATTN: SERVICE MANAGERS

GAMES: ALPINE SKI, WILD WESTERN, JUNGLE HUNT, FRONTLINE, QIX, KRAM,
SPACE DOUNGEON, ELECTRIC YO-YO (GAMES WITH AMERICAN POWER
SUPPLY)

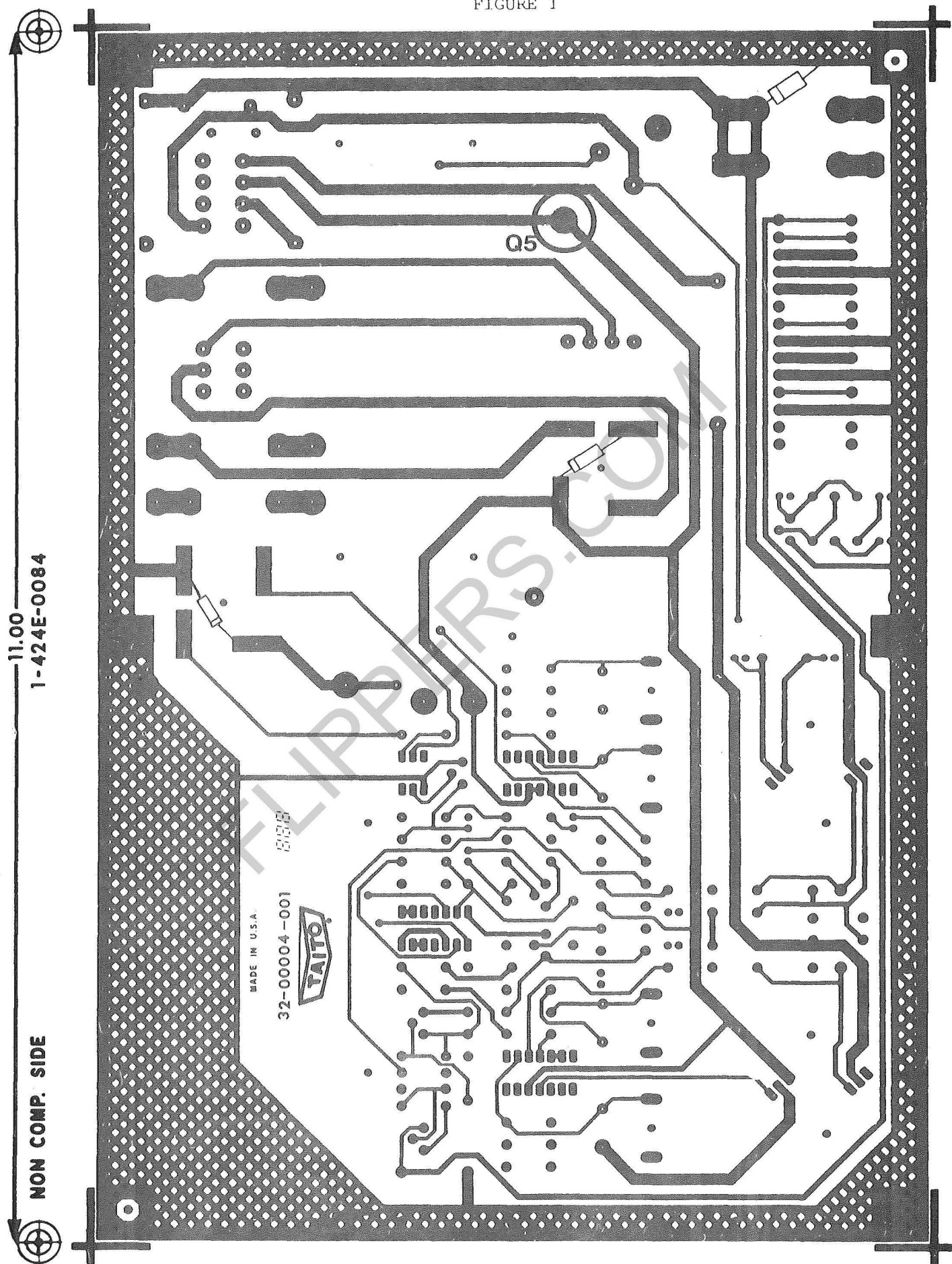
SUBJECT: POWER SUPPLY +5 VOLT PROBLEMS

SOLUTION: IMPROVE Q5'S CONNECTION ON POWER SUPPLY

PARTS NEEDED: NONE

PROCEDURE: REMOVE THE TWO NUTS AND BOLTS HOLDING DOWN Q5. ON THE ETCH
SIDE OF THE BOARD (REFER TO FIGURE 1), SCRAPE THE GREEN SOLDER
RESIST OVER THE FOIL AROUND THE SCREW PAD FOR Q5. WET THE
PAD WITH SOLDER TO MAKE SURE THAT ALL SOLDER RESIST MATERIAL
IS REMOVED. REPLACE NUTS AND BOLTS FOR Q5.

FIGURE 1



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83-6

ATTN: SERVICE MANAGERS

GAMES: ALPINE SKI, WILD WESTERN, JUNGLE HUNT, FRONTLINE, QIX, KRAM,
SPACE DUNGEON, AND THE ELECTRIC YO-YO

SUBJECT: COIN DOOR CABLE CAN GET PINCHED IN COIN DOOR FRAME.

SOLUTION: RE-ROUTING OF COIN DOOR CABLING AND ITS HARNESS AS FOLLOWS:

PARTS NEEDED: 1. PLASTIC CABLE CLAMP, TAITO PART # 59-00004-004
2. PLASTIC CABLE TIE, TAITO PART # 59-00003-001

DISPOSITION OF OLD PARTS: SCRAP

- PROCEDURE:
1. RE-ROUTE COIN DOOR HARNESS AS FOLLOWS:
 - A. UNLOCK AND OPEN COIN DOOR.
 - B. UNLATCH AND REMOVE GAME CONTROL PANEL.
 - C. REMOVE SECOND CABLE CLAMP ON THE LEFT OF THE HARNESS THAT RUNS ABOVE THE COIN DOOR.
 - D. IF THERE ARE ANY EXTRA LOOSE WIRES ON THE HARNESS NOW FREE, USE 4" TIE-WRAP (59-00003-001) TO BIND THEM TO THE HARNESS.
 - E. UNPLUG MOLDED CONNECTOR TO COIN DOOR.
 - F. REMOVE CABLE CLAMP HOLDING POWER INTERLOCK WIRING, AND REINSTALL AROUND THE HARNESS THAT IS NOW FREE.
 2. RE-ROUTE CABLE ON COIN DOOR AS FOLLOWS: (SEE FIG. 1)
 - A. SNIP WIRE TIE THAT HOLDS FLEXIBLE CABLE TO COIN DOOR (ABOVE SERVICE SWITCH BRACKET).

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- B. RE-ROUTE CABLE TO THE LEFT OF AND UNDER THE SERVICE SWITCH BRACKET.
 - C. REMOVE UPPER RIGHT NUT FROM THE TOP COIN COUNTER.
 - D. REINSTALL NUT TRAPPING SMALL CABLE CLAMP (59-00004-004) AROUND COIN DOOR CABLE ON COIN COUNTER SO THE CABLE IS NOW POSITIONED HALF-WAY DOWN THE COIN DOOR HINGE.
3. REINSTALL CABLES AS FOLLOWS: (SEE FIG. 2)
- A. REMOVE LOWER RIGHT SCREW ON INTERLOCK ASSEMBLY COVER.
 - B. REINSTALL SCREW, ANCHORING PREVIOUSLY REMOVED CABLE CLAMP AROUND COIN DOOR CABLE.
 - C. RECONNECT MOLDED CONNENCTORS FOR COIN DOOR CABLE.
 - D. VERIFY THAT CABLE FREELY MOVES THROUGH CABLE CLAMP UNDER INTERLOCK ASSEMBLY COVER, TO PREVENT PINCHING THE CABLE.

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FIGURE 1

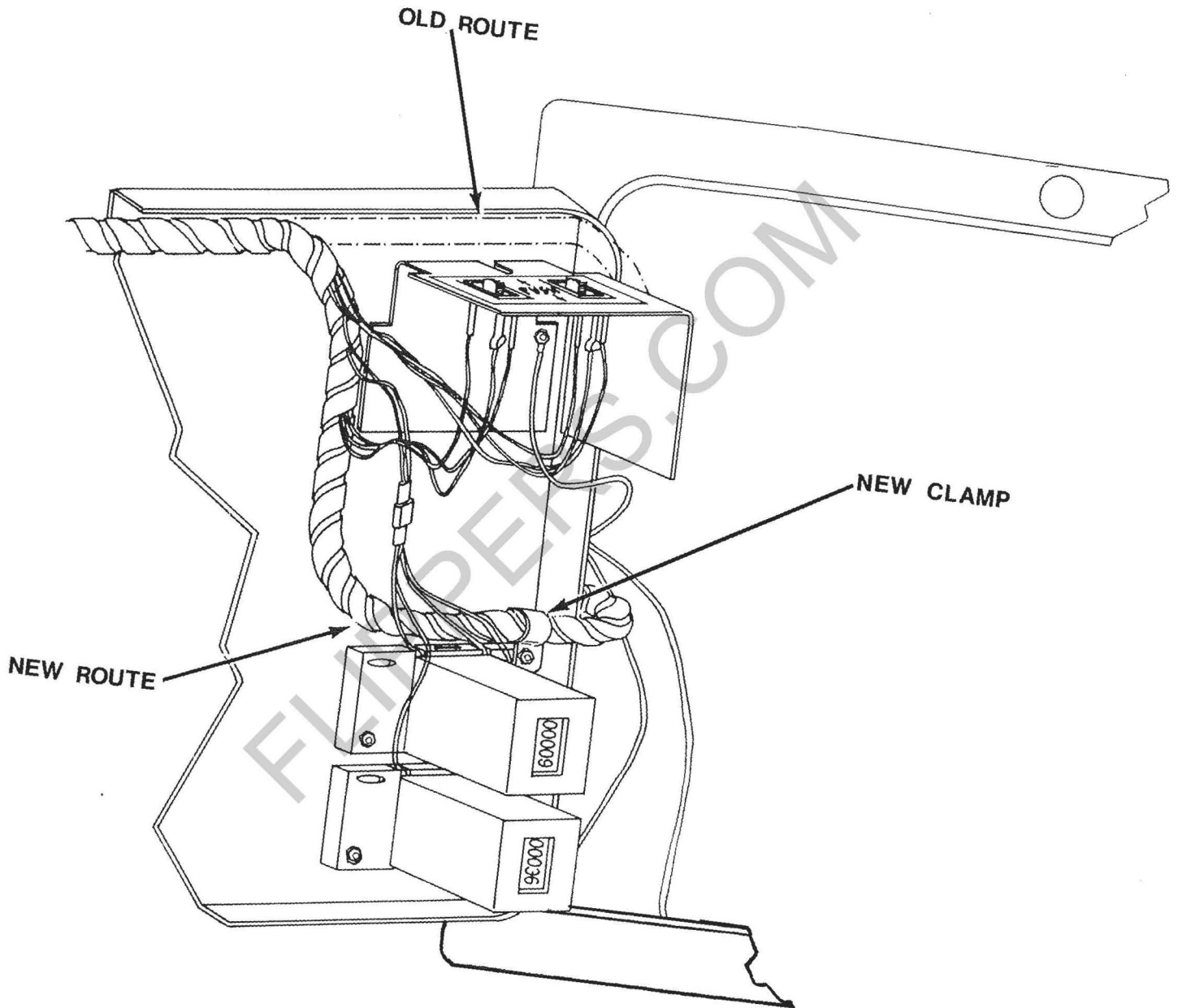
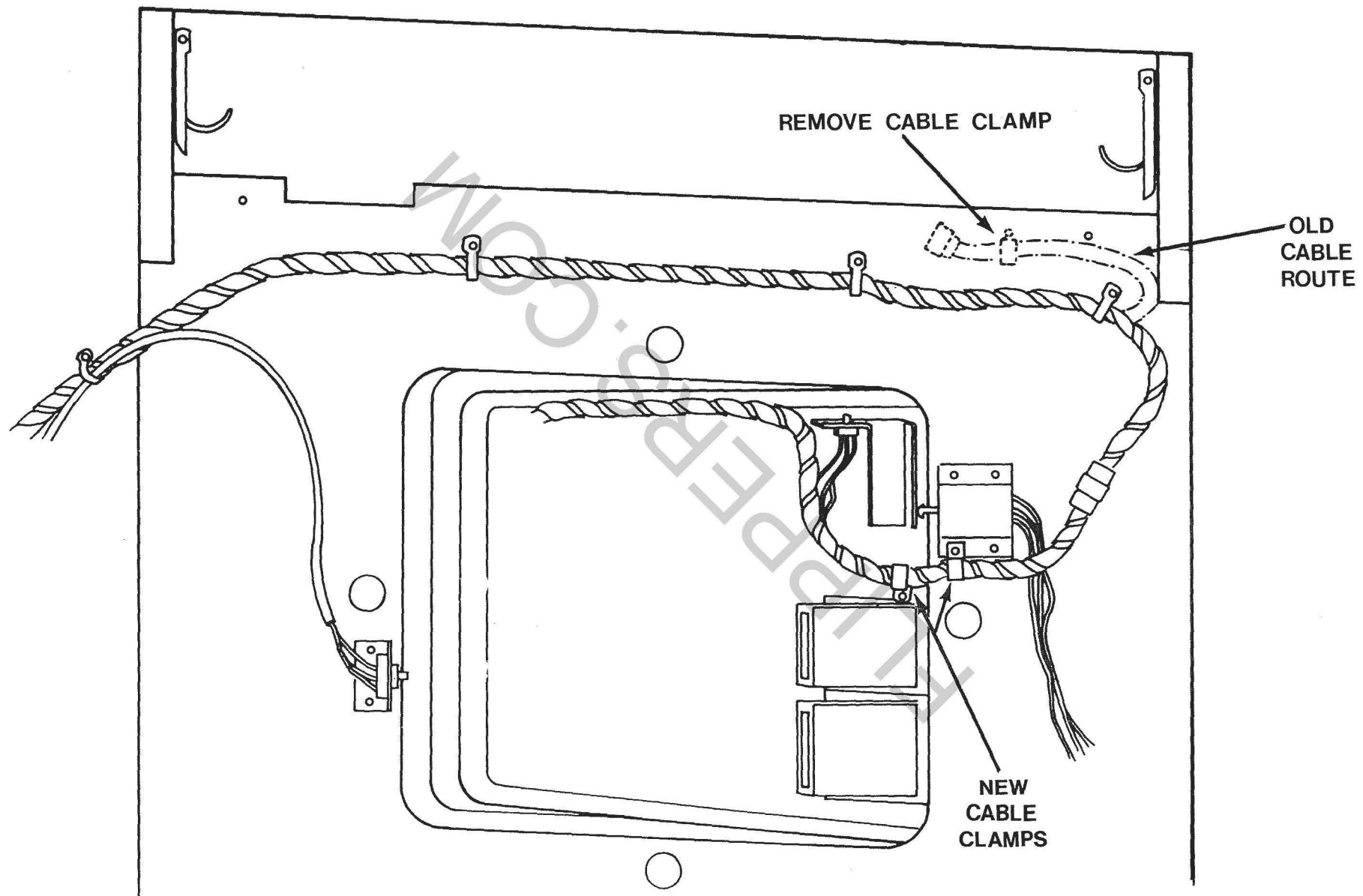


FIGURE 2



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ATTN: SERVICE MANAGERS

GAMES: ALPINE SKI, WILD WESTERN, JUNGLE HUNT, FRONTLINE, QIX, KRAM,
SPACE DOUNGEON, ELECTRIC YO-YO (GAMES WITH AMERICAN POWER
SUPPLY)

SUBJECT: POWER SUPPLY'S +5 VOLT FAILURE TROUBLE SHOOTING HINTS

SOLUTION: WE HOPE THE FOLLOWING PROCEDURES WILL BE HELPFUL IN ISOLATING
FAILURES IN THE +5 VOLTS CIRCUIT. THE TYPICAL SYMPTOMS INCLUDE:

- 1) BR1 GETS EXCESSIVELY HOT AFTER HEAT SINK (#30-00005-001) IS
INSTALLED.
- 2) F1 BLOWS REPEATEDLY AFTER SEVERAL HOURS OF NORMAL OPERATION.
- 3) +5 VOLT SEEMS TO FLUCTUATE (L.E.D. 1 SEEMS TO FLICKER).
- 4) ROLLING DARK BARS ACROSS THE SCREEN VERTICALLY.

PARTS NEEDED: ON FAILURE, AS ENCOUNTERED.

PROCEDURE: SYMPTOMS 1 & 2 :

ANY TIME THAT "BR1" (BRIDGE RECTIFIER 1) IS REPLACED, THE FUSE
HOLDER FOR F1 SHOULD BE RESOLDERED. WHEN INSTALLING A NEW BR1,
ENSURE THERE IS AT LEAST 1/8 INCH CLEARANCE BETWEEN THE BOARD
AND THE RECTIFIER. FAILURE TO DO SO MAY RESULT IN FURTHER F1
AND/OR BR1 FAILURE.

NOTE: F1 AND F2 ARE 10 AMP FUSES NO MATTER WHAT IS ETCHED ON
THE POWER SUPPLY BOARD.

THERE ARE COMPONENTS UNDER THE POWER SUPPLY THAT LOOK LIKE DIODES (REFER TO FIGURE 1 AND 2)(ON ISS. "C" OF THE POWER SUPPLY THEY ARE CALLED D13, D14, D17 AND ARE ON THE COMPONENT SIDE). THESE COMPONENTS ARE CALLED TRANSORBS. THEY ARE USED TO COMPENSATE FOR FLUCTUATING A.C. LINE VOLTAGES. MEASURING THEM OUT OF CIRCUIT, OTHER THAN CHECKING FOR SHORTS, IS USELESS. THE ONLY WAY TO TEST THEM IS TO TAKE THEM OUT OF CIRCUIT, AND THEN POWER UP THE POWER SUPPLY WITH A LOAD. IF THE VOLTAGE, AFTER ADJUSTMENT, IS CORRECT, THEN THE TRANSORB NEEDS TO BE REPLACED.

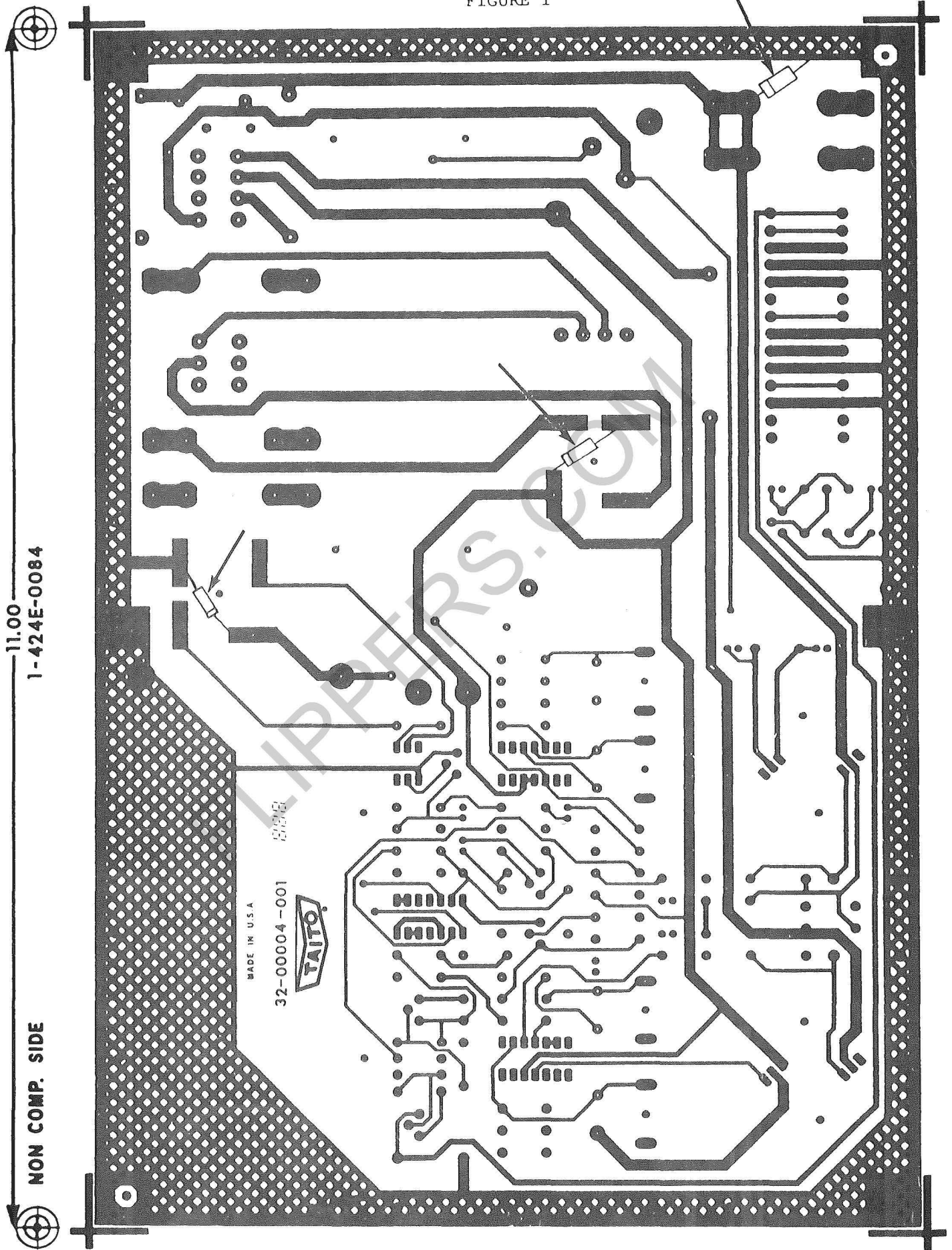
SYMPTOMS 3 & 4 :

ENSURE THAT THE SCREWS ON C7 AND C9 (REFER TO FIGURE 2) ARE TIGHT. AFTER THE SCREWS ARE TIGHT, MEASURE, WITH THE METER IN AC VOLTAGE MODE, THE OUTPUT OF +5V. THE RIPPLE SHOULD BE LESS THAN A QUARTER OF A VOLT (0.25 V). IF NOT, C7 COULD BE THE PROBLEM.

IF THE +5 VOLTS OUTPUT IS LESS THAN 0.7 VOLTS, MEASURE THE PLUS SIDE OF C7. THERE SHOULD BE AT LEAST +10 VOLTS D.C. IF IT IS LESS THAN 10 VOLTS, THEN ONE OF SIX THINGS COULD BE WRONG:

- 1) F1 IS BLOWN.
- 2) A.C. INPUT BETWEEN J1 PIN 1 & 2 IS LESS THAN 10 VOLTS AC.
- 3) BR1 IS WEAK.
- 4) THE TRANSORB FOR BR1 IS WEAK.
- 5) C8 IS SHORTED.
- 6) C7 IS SHORTED.

FIGURE 1



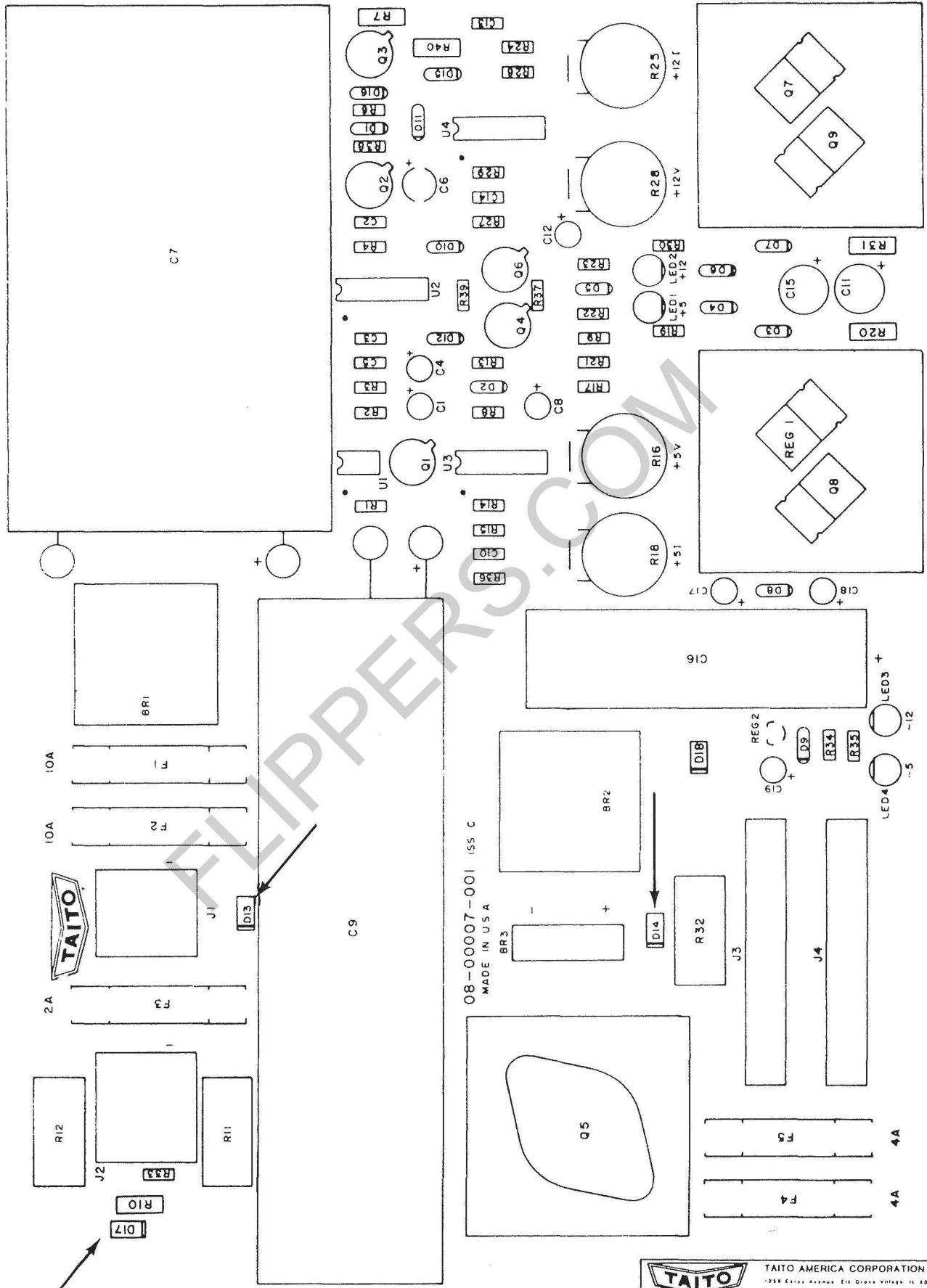
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NON COMP. SIDE

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32-00004-001
TAITO

TRANSORB POWER SUPPLY ISS.C

FIGURE 2



08-00007-001 ISS C
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DATE	REV.	BY	CHKD.

FRONT LINE™
Power Supply Board Layout

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83-9

ATTN: SERVICE MANAGERS

GAMES: QIX, SPACE DUNGEON, KRAM, ELECTRIC YOYO, ZOOKEEPER

SUBJECT: BATTERY POWER FOR THE CMOS RAMS ON THE VIDEO BOARD.

SOLUTION: WHEN THESE GAMES ARE POWERED DOWN, THERE STILL IS BATTERY TO THE CMOS RAM ON THE VIDEO BOARD (U85 AND U86). THE FOLLOWING IS THE RECOMMENDED PROCEDURE TO REMOVE POWER FROM THESE CMOS RAMS.

PARTS NEEDED: NONE

- PROCEDURE:
- 1) OPEN THE BACK DOOR AND PULL OUT THE POWER INTERLOCK SWITCH AND POWER THE GAME UP.
 - 2) REMOVE THE W1 JUMPER THAT IS LOCATED TO THE RIGHT OF THE BATTERY ON THE VIDEO BOARD.
 - 3) POWER THE GAME DOWN AND WAIT FOR A MINIMUM OF TWO MINUTES.

NOW THE POWER IS REMOVED FROM THE CMOS RAMS. ALL INFORMATION IN THESE RAMS IS LOST. NOW YOU MAY REPLACE THE CMOS RAMS WITHOUT DANGER OF RUINING THE NEW CHIPS.

NOTE:

IN ORDER FOR THESE RAMS TO FUNCTION PROPERLY, THEY MUST BE REPROGRAMED. TO ENABLE THIS, YOU MUST OPEN THE COIN DOOR AND ONLY PULL OUT THE BOTTOM INTERLOCK (THE TOP INTERLOCK MUST BE LEFT IN THE NEUTRAL POSITION). STEP THE ADV. TEST BUTTON, UNTIL THE ATTRACT MODE IS ON THE SCREEN.

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