TM-036

TANK!

Cocktail Table

Operation · Maintenance · Service Manual

KEE GAMES

A SUBSIDIARY OF ATARI

ATARI INC 14600 WINCHESTER BOULEVARD, LOS GATOS, CALIFORNIA 95030 • TELEPHONE (408) 374-2440 • TELEX 357-488

TABLE OF CONTENTS

Section 1

General Maintenance Information

1.1 INTRODUCTION

The Atari Tank game consists of a cocktail-table cabinet, TV monitor, two printed circuit boards (PCBs), interconnecting wiring, and various cabinet-mounted circuit components. Except for a schematic and basic TV troubleshooting procedures, no information about the TV monitor is presented in this manual. The TV monitor is a Motorola XM501 unit. TV circuit malfunctions can be solved using the described standard TV troubleshooting techniques that may be familiar to the average technician. Therefore, the PCB information in this manual is dedicated mainly to minor adjustments and instructions on shipping boards to Atari, Inc. for servicing.

1.2 WARRANTY (same as printed on inside front cover)

Seller warrants that its printed circuit boards and parts thereon are free from defects in material and workmanship under normal use and service for a period of ninety (90) days from date of shipment. Seller warrants that its television monitors are free from defects in material and workmanship under normal use and service for a period of thirty (30) days from date of shipment. None of the Seller's other products or parts thereof are warranted.

If the products described in this manual fail to conform to this warranty, Seller's sole liability shall be, at its option, to repair, replace, or credit Buyer's account for such products which are returned to Seller during said warranty period, provided:

(a) Seller is promptly notified in writing upon discovery by Buyer that said products are defective;

(b) Such products are returned prepaid to Seller's plant; and

(c) Seller's examination of said products discloses to Seller's satisfaction that such alleged defects existed and were not caused by accident, misuse, neglect, alteration, improper repair, installation or improper testing.

In no event shall Seller be liable for loss of profits, loss of use, incidental or consequential damages.

EXCEPT FOR ANY EXPRESS WARRANTY SET FORTH IN A WRITTEN CONTRACT BETWEEN SELLER AND BUYER WHICH CONTRACT SUPERSEDES THE TERMS OF THIS ORDER, THIS WARRANTY IS EXPRESSED IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND OF ALL OTHER OBLIGATIONS OR LIABILITIES ON THE SELLER'S PART, AND IT NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR THE SELLER ANY OTHER LIABILITIES IN CONNECTION WITH THE SALE OF PRODUCTS UNDER THIS ORDER.

1-3 NEW MACHINE SETUP PROCEDURE

Before turning this machine on, inspect it carefully for any damage that may have occurred during shipment. Inspect both interior and exterior of the machine for any obvious damage to the cabinet or internal components. Check for cracked or broken cabinet parts, assemblies pulling loose, broken or disconnected wires, or foreign objects shorting electrical connections. After the machine has been plugged in and turned on, perform the checkout procedure, Section 1-5.

1-4 INTERIOR ACCESS

All servicing is performed inside the machine through the hinged top that provides access to all components, sub-assemblies and adjustments with the exception of the coin box.

The coin door is located on the front of the machine underneath the control panel. To remove the coins, unlock the metal coin door, grasp the door lip and pull out the coin box.

To reach the interior of the machine, unlock coin door and reach upwards just inside the door opening. Near the top of the interior compartment is a chain. Pull down on this chain and, with the other hand, lift up the hinged top. To hold top open, lift up metal support rod on the right side of base's top edge and insert end of rod into oval slot at right front side of TV chassis.

Please note that two interlock switches are provided for the game, so that the machine is completely turned off whenever either the top or coin door is opened. These switches protect the operator from accidental shock and so they must always be kept in perfect working order. If the machine is

adjusted or tested with the rear door open, the interlock switches must be placed in the closed (or "on" position) by pulling out the white actuator shafts.

> WARNING: The covered black terminal block carries full line voltage whenever the line plug is connected to a power outlet. This cover should be removed only with the line plug disconnected. Do not leave off the cover once it has been removed.

1-5 NEW MACHINE CHECKOUT

As each new machine leaves the factory, every component and subassembly is carefully checked for proper operation. However, since parts may have been damaged or adjustments changed during shipping, the following checkout procedure must be repeated prior to placing the machine on location:

A. Carefully inspect the interior of the machine to see that all solder joints, slip-on connectors and plug-in type connectors are firmly seated. Pay particular attention to the PCB edge connector, the fuses and any connectors to the potentiometers. Also check the connections to the coin switch, the TV monitor, the interlock switches and all the other Molex-type connectors.

B. Plug the machine in, and pull out the white actuator shafts of the interlock switches if the rear door is open. Inspect the cathode ray tube (CRT) image for a steady and sharp picture that exhibits the proper levels of brightness and contrast.

C. Insert several old and new coins into the coin acceptor. No genuine coin should be rejected and each coin insertion should advance the coin counter one digit. Depress the coin rejector button to make sure the linkage is operating smoothly.

D. Coin insertion should start the game. Check for proper game sequence, making sure that all aspects of the game are functioning correctly.

E. The door locks should turn to the locked and unlocked positions smoothly and the doors should open and close without binding.

F. The interlock switches must turn off the entire machine when the rear door is opened.

1-6 GAME OPERATION

Inserting coins immediately starts the game with one tank in upper left area of the playfield and the other in lower right.

To move tank forward, push both joysticks forward. To stop tank, pull both joysticks back. To turn to right, pull right joystick back and push left joystick forward. Left turns are in opposite directions.

Illustrated instructions for the different motions are silkscreened on front panel.

To fire shells, push down red button on right joystick. One point is scored each time a shell hits the other tank. If tank hits a mine, player's opponent gains one point and mine will disappear for remainder of that game. When a tank is hit by a shell or encounters a mine, an explosion sound is heard and tank flashes. Until flashing has stopped, player's opponent cannot fire another shell. About 20 seconds before game ends, score display will begin flashing and continue until game ends.

1-7 TV ADJUSTMENTS

Monitor circuitry includes four stages of video amplification - a two-stage audio amplifier, sync and deflection circuits, and a regulated power supply. An additional 5-volt supply is included to power the external logic system. The adjustment of the TV monitor functions like that of a normal TV set. The only exception is that the TV's audio portion is not used. The volume control is located on the PCB. The CRT image is adjusted through the top door.

A. Brightness: Adjust the brightness, then the contrast. Adjust so that the CRT background is as dark as possible.

B. Contrast: Adjust so that images displayed on the CRT are as bright and clear as possible without being blurred or smeared.

C. Vertical Hold: Adjust the vertical hold only if the picture is rolling up or down the screen. Adjust for a centered picture by turning the control to the middle of the stable range.

D. Horizontal Hold: If the picture is slightly off-center horizontally, if the images appear warped, or if the picture is broken into a series of diagonal lines, adjust the horizontal hold same as vertical hold.

E. Yoke: The yoke should never need adjustment unless the controls have been tampered with or the machine damaged. If yoke adjustment is necessary, adjust both yoke rings simultaneously for optimum centering of the image on the CRT. This adjustment is best handled by a qualified service person.

F. Five-Volt Supply: This is located on the power/audio PCB which is on the left side of the monitor behind the power transformer. There is a 1000-ohm trimpot to adjust the supply voltage. This measurement should be made on the logic PCB to allow for a voltage drop between monitor and PCB.

G. Regulator Adjustment: Connect monitor to AC line supply. Adjust horizontal and vertical controls until display is synced. Connect a precision voltmeter to any of the 73-volt test points and adjust regulator control R74 on PCB for an output of 73 volts. CAUTION: Do not run the regulator control through its range or you may damage the monitor. Only a slight turn is necessary for proper adjustment. Both the 5-volt and 73-volt adjustments have been made at the factory and under normal conditions should not need readjustment.

H. AC Voltage Switch: Set this switch to the 115V position ("115" visible on the switch) if the machine is connected to a 115-volt source. Set it to the 230V position ("230" visible on the switch) if the machine is connected to a 230-volt source. The TV monitor will not function if this switch is misadjusted. NOTE: If the monitor of a 230-volt machine is set to 115 volts, it will blow the machine line-fuse repeatedly.

I. TV Monitor Fuse: One 6/10-amp, 250-volt fast-blow fuse protects the TV from electrical overload (for 155-volt operation, the TV fuse must be 1-amp fast-blow). Replace blown fuses ONLY with those having the above rating. This fuse is located on the electronics mounting board inside the rear door. The fuse farthest from the door is the TV fuse, and the fuse nearest the door is the PCB fuse. The PCB fuse should be replaced ONLY with a one-amp, slow-blow, 250-volt fuse.

> CAUTION: Any work performed on monitor chassis should be done only by qualified service personnel who are familiar with servicing procedures and precautions.

1-8 GAME CIRCUIT BOARD ADJUSTMENTS

On Circuit Board 1 (on the left side of cabinet, as seen from its rear) there are three adjustments you may want to make:

A. Master volume: These adjustments are located in the upper right area of the board. There is a small tab on each of these pots. When these are set at the same point, the volume of both tanks will be equal.

B. Missile firing and explosion sound: These adjustments are located in the upper left area of the board. Again there are two pots to adjust. Setting the tabs evenly on the pots will set the volume evenly between the two tanks.

C. Game time: There is only one switch located on Circuit Board 1; next to this switch is the pot that adjusts game time. This pot has been preset at the factory: switch in the 25¢ position, one game costs a quarter and will last 60 seconds. With the switch in the 50¢ position, one game costs two quarters and will last 120 seconds. You may set this switch as you wish and also adjust the time pot to your convenience.

Do not attempt to adjust any other pots located on these boards, as they are factory adjustments and tampering with them may have detrimental effects upon the game.

1-9 Q-530 COIN ACCEPTOR

All coin acceptors leave the factory adjusted for maximum performance. If, however, more critical adjustments are desired, or if the unit has been completely disassembled for service, the following adjustment procedure is suggested. If the coin acceptor has been removed from the machine, place it in a vertical position on a level surface. If the acceptor is still mounted on the coin door, place the coin door in a vertical position on a level surface. See exploded coin acceptor and mechanism drawings on pages 1-10.

A. Kicker and separator:

(a) Set the acceptor with the back of the unit facing you in the test position.

(b) Loosen the screws holding the kicker (1) and the separator (3) and move both the kicker (2) and the separator (4) as far to the right as they will go. Tighten the screws.

(c) Insert several test coins (both old and new) and note that some are returned by striking the separator.

(d) Loosen the separator screw and move the separator a slight amount to the left. Tighten the screw.

(e) Insert the test coins again and, if some of them are still returned, repeat step (d) until all the coins are accepted.

(f) Loosen the kicker screw and move the locker as far to the left as it will go. Tighten the screw.

(g) Insert the test coins and note that some are returned.

(h) Loosen the kicker screw and move the kicker a slight amount to the right. Tighten the screw.

(i) Insert the coins again and, if some are still returned, repeat step (h) until all the coins are accepted.

(j) Be sure that both screws are tight after the adjustments have been made.

B. Magnet gate:

(a) Set the acceptor with the front of the unit facing you in the test position.

(b) Turn the magnet gate adjusting screw (2) out or counterclockwise until none of the coins will fit through.

(c) With a coin resting in the acceptor, turn the adjuster in or clockwise until the coin barely passes through the magnet gate.

(d) Test this adjustment using several other coins, both old and new, and if any of them fail to pass the magnet gate, repeat step (c) until all the coins are accepted.

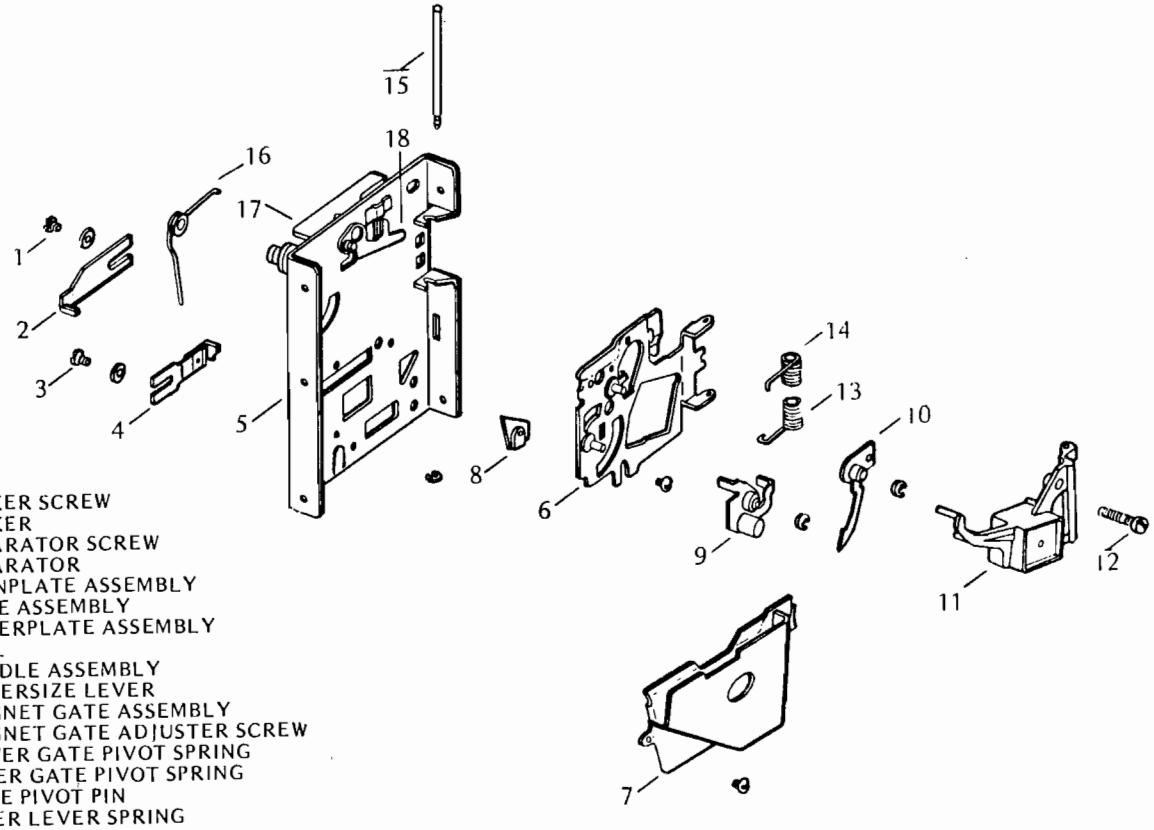
(e) Fix the magnet gate in this position with a drop of glue or Loctite , if necessary.

C. Acceptor maintenance:

Depending on the environment in which the acceptor is used, periodic preventive maintenance should be performed. The mainplate (5) may be cleaned with any household cleaner. Thorough rinsing and drying are necesasry to remove deposits and/or film. Remove all metal particles from the magnet by guiding the point of a screwdriver or similar tool along the edges of the magnet. You will notice that the particles will cling to the point of the tool. Remove the transfer cradle (9) and the undersize lever (10) and clean the bushings and the pivot pins. A pipe cleaner is an effective cleaning tool. Apply powdered graphite or pencil lead to the pivot pins and bushings and reassemble. Spray the entire unit lightly with WD-40®, a lubricant.

1-10 GENERAL MACHINE MAINTENANCE

Due to its solid-state circuitry, your machine will require very little maintenance other than periodic cleaning, lubrication and TV monitor adjustment. The cabinet and plexiglass screen may be cleaned with any non-abrasive household cleaner. The coin acceptor and the rejector linkage should be sprayed lightly once every three months with WD-40® or a silicone lubricant. The potentiometer shafts must never be lubricated in any way. The TV monitor is adjusted only when the CRT picture is distorted, or if the contrast or brightness appears to be out of adjustment.



1 KICKER SCREW
2 KICKER
3 SEPARATOR SCREW
4 SEPARATOR
5 MAINPLATE ASSEMBLY
6 GATE ASSEMBLY
7 COVERPLATE ASSEMBLY
8 RAIL
9 CRADLE ASSEMBLY
10 UNDERSIZE LEVER
11 MAGNET GATE ASSEMBLY
12 MAGNET GATE ADJUSTER SCREW
13 LOWER GATE PIVOT SPRING
14 UPPER GATE PIVOT SPRING
15 GATE PIVOT PIN
16 WIPER LEVER SPRING
17 WIPER LEVER
18 WIPER

FIGURE D: COIN ACCEPTOR – EXPLODED

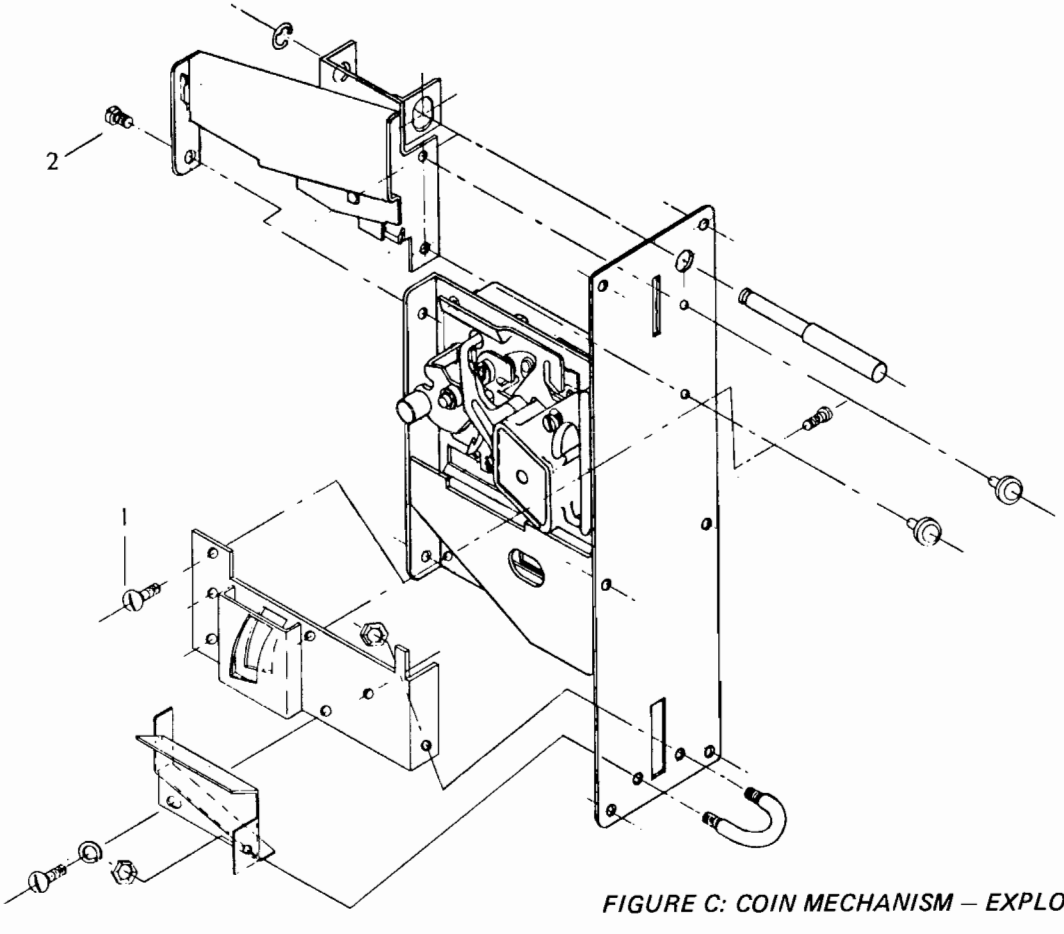


FIGURE C: COIN MECHANISM – EXPLODE

Section 2

Service Information

2-1 TEST EQUIPMENT

In order to test any Atari PCB, some items such as the logic probe are absolutely essential. Others are desirable and will make the test procedure easier but are not absolutely essential. Some of these instruments are available from the Atari Customer Service Department and are: the Kurz-Kasch 520 Logic Probe, the Atari Video Probe, and the Hewlett-Packard 10529A Logic Probe. Other instruments that are very useful are the HP 10526T Logic Pulser and the Tektronix 465 Oscilloscope. These items are available through your local electronics supply house.

2-2 REQUIRED EQUIPMENT

The following items are essential to perform the test procedures presented in this manual:

A. Logic Probe: This instrument is designed for checking the outputs of integrated circuits. The Kurz-Kasch Logic Probe, Model Number LP-520, which is available through the Atari Customer Service Department or most large electronics supply houses, is recommended. This logic probe indicates if a signal is a logic high, logic low, or changing from one state to another. Consult the operating instructions included with the probe for further details about its operation.

B. Video Probe: This probe is a very simple but extremely useful device and consists of two test clips, a length of rubber-coated, test lead wire, and a 4.7K ¼-watt carbon resistor. Video probes may be obtained from the Atari Customer Service Department, or, if necessary, they can be assembled from standard components available at all electronics supply houses.

2-3 OPTIONAL EQUIPMENT

It is possible to find 90% of the possible PCB computer malfunctions without the following items. However, if a complete set of troubleshooting equipment is desired, Atari recommends the following:

A. Hewlett-Packard 10529A Logic Comparator: This device is used to verify correct IC operation. It simply clips onto in-circuit ICs and instantly displays any logic state difference between the in-circuit test IC and the reference IC in the comparator. Logic differences for each pin of a 14 or 16 dual in-line package are indicated by a lamp on the comparator. If the logic comparator is purchased from the Atari Customer Service Department, it is shipped with 20 pre-programmed reference PCBs. If the device is purchased elsewhere, these PCBs must be specially programmed.

B. Hewlett-Packard 10526T Logic Pulser: This device is used to stimulate in-circuit ICs so that they are driven to their opposite states. This device is available from the Atari Customer Service Department or can be obtained from most large electronics supply houses.

C. Tektronix 465 Oscilloscope: This oscilloscope is used for viewing various waveforms and should be ordered from Tektronix. Consult the manufacturer's operating instructions for details on oscilloscope operation.

2-4 REMOVAL AND REPLACEMENT PROCEDURES

A. Joystick controls: To gain access to joystick controls, open the top door and remove 10 screws holding joystick control covers to the top. Then remove 6 nuts and bolts holding joystick controls in table top. The joystick controls are now accessible for servicing.

B. TV monitor: To remove monitor, open top door; have a second person hold up top and support the TV. Leave support bar hanging inside table. Remove the 12-pin Molex connector from rear of TV. Then carefully remove pair of nuts holding each of the two tie bars. TV can now be lowered from its frame in the table top.

C. Monitor power/audio PCB: To remove this board, locate it on left side of monitor behind power transformer. Carefully pull up on the board. To replace this board, locate slot between pins 3 and 4. Keeping slot on your left side, insert board into edge connector.

D. Monitor main PCB: To remove this board use a screwdriver or similar object and slowly pry the board up off the chassis at several places along the edge until it clears the pins. Then unplug socket from yoke and lift board up. To replace this board, follow above steps in reverse order.

E. Game circuit boards 1 and 2: Each board is mounted to the cabinet by a screw located on each side. Remove edge connectors first, then remove the four screws. DO NOT TRY TO SEPARATE THE TWO BOARDS. They must remain as one unit. After removing boards, carefully follow board shipping procedure (section 2-6) in order to minimize chances of damage. To replace the set of boards, follow above steps in reverse order.

2-5 TROUBLESHOOTING

The first step in any troubleshooting procedure is to observe the characteristics of the malfunction. With these clues in mind, examine the areas of the machine that might cause these symptoms. For example, if there is no power, check the harness — not the PCB. Likewise, if part of the playfield display is missing, check the PCB — not the harness or TV.

Three major areas of the game can be isolated for troubleshooting purposes: the TV, the PCB, and the harness. The harness includes the fuses, the transformer, the interlock switches, the AC line filter, the start and coin

switches, the antenna wire, the potentiometers, all plug-in type connectors, the PCB edge connector, and all the interconnecting wires.

A. Substitution: Substitution of parts is a legitimate and easy way to troubleshoot the machine. For instance, if you suspect a PCB malfunction, try substituting another known-to-be-good PCB. To check the TV monitor by substitution, connect the malfunctioning game to a known-to-be-good monitor. Harnesses are checked by elimination. Substitute a good TV and PCB, and if the malfunction persists, the harness must be at fault.

B. Other troubleshooting tips: If you have only a TV raster* and you want to determine if the PCB or the TV is causing lack of video display, try the following test:

(a) Disconnect the PCB edge connector;
(b) Turn the brightness and contrast all the way up;
(c) Touch video input to TV, pin 10 on PCB edge connector.

If your TV monitor is functioning correctly, you will see faint black bars or "hum bars" on the screen.

C. Troubleshooting by symptom:

(a) No power: check for correct line voltage. If correct, check fuses and interlock switches. If these are alright, check transformer primary, which should show line voltage. Then check transformer secondary (pins 3 and 21) which should be 10 VAC with respect to ground. Also check to see if the interlock switch is on, either with the top door closed or with the switch defeated.

(b) Game credit shuts off: try cutting the antenna wire shorter in increments of 1-2 inches.

(c) Game credit shuts off and/or TV picture shrinks: check line voltage with VOM and be aware that a large motor nearby (such as an air conditioner) may drop line voltage when starting up.

*a TV raster is a black but lighted TV screen with the brightness turned all the way up.

(d) No picture or raster: check to see if TV connector is plugged in; check for line voltage at TV, and whether the latter's AC voltage switch is set to correct position. Check TV fuses and brightness control. If fuses are alright, check if the CRT's choke filament is glowing and if there are any loose wires.

(e) TV raster only: check harness and especially the PCB edge connector. Check PCB, TV, and especially the 12-pin Molex connector on TV.

(f) Picture rolls: adjust TV vertical hold. Check or replace PCB.

(g) Picture is wavy: First check volt power supply on two game circuit boards. Do this by measuring between the two heavy traces on each board with voltmeter or oscilloscope. There should be 5 ± ¼ volts on each board. Next, locate pin 32 on large monitor circuit board. Measure voltage from this pin to ground. There should be 73 volts at this point. If voltage is either too high or too low, adjust 73-volt regulator pot located on same PCB in upper left-hand corner. DO NOT TURN THIS POT THROUGH THE WHOLE RANGE or you may damage it. Only a slight turn is necessary. In addition, you may need to adjust TV horizontal hold, replace transformer, and/or check harness (particularly grounds).

(h) Picture is broken into diagonal lines: adjust TV horizontal hold. Replace PCB.

(i) Jerky tank motion: replace appropriate potentiometer.

(j) No game credit: check coin mechanism and switch, and the harness. Replace PCB.

(k) Game sequence incorrect or parts of playfield display missing, distorted or not functioning: replace PCB.

(l) No audio: check volume control, speaker connections. Replace PCB.

(m) White picture but no display: check edge connector on logic PCB, 5-volt supply from monitor, and 12-pin Molex connector on monitor.

(n) No firing of shell or tank movement. Check joystick switches and harness connections. The joystick switches are simple on/off switches and may be checked with an ohmmeter or continuity tester.

2-6 PCB SHIPPING PROCEDURES

When packaging PCBs for shipment, make sure the top of each board is facing the other and that bubble wrap or foam rubber is between them. This interfacing must be thick enough to insure that parts of one board do not come in contact with the other board. DO NOT USE small pieces of styroform as packing material between the boards. Careful packing is recommended as Atari cannot be liable for items damaged in transit. Also, include a short statement describing the problem encountered with the game.

2-7 LOGIC TYPES AND FUNCTIONS

7400	Quad 2-input NAND gate
7402	Quad 2-input NOR gate
7404	Hex inverter
74S04	Hex inverter
7408	Quad 2-input AND gate
7410	Triple 3-input NAND gate
7413	Dual NAND Schmitt trigger
7420	Dual 4-input NAND gate
7425	Dual 4-input NOR with strobe
7427	Triple 3-input NOR gate
7430	Single 8-input NAND gate
7448	BCD-to-7 segment decoder
7450	Dual AND/OR gate (inverter/expander)
7474	Dual-D flip flop
7483	4-bit full adder
7486	Quad exclusive OR gate
7490	Decade counter
7492	Divide-by-12 counter
7493	4-bit binary counter
74107	Dual JK M/A flip flop
74153	Dual 4-bit multiplexer

LOGIC TYPE	FUNCTIONS
74157	Quad 2-input data selector/multiplexer
74165	Parallel-load 8-bit shift register
74192	Synchronous decade up/down counter
74193	Synchronous binary up/down counter
LM380	Amplifier
NE555	Timer
NE566	Function generator
747	Dual operational amplifier
RC4136D	Quad operational amplifier
MFC6040	Voltage-controlled operational amplifier
8098	Hybrid
8103	Hybrid
8099	Hybrid
9311	One-of-sixteen decoder/demultiplexer
9312	8-input multiplexer
9314	Quad latch
9316	4-bit binary counter
9321	Dual one-of-four decoder
9602	Dual monostable multivibrator
74186	ROM

Section 3

Schematics, Drawings and Parts Lists

Number	Title
003860	Parts List, Top Assembly
A003860	Top Assembly
003857	Parts List, Joystick Assembly
A003857	Joystick Assembly
004032	Harness Schematic
003861	Parts List, Electronics Tray Assembly
A003861	Electronics Tray Assembly
003110	Board I Schematic
003110	Parts List, Board I Assembly
A003110	Board I Assembly
003112	Board II Schematic
003112	Parts List, Board II Assembly
A003112	Board II Assembly
[none]	Motorola XM501/XM701 Monitor Schematic

C.T. TANK

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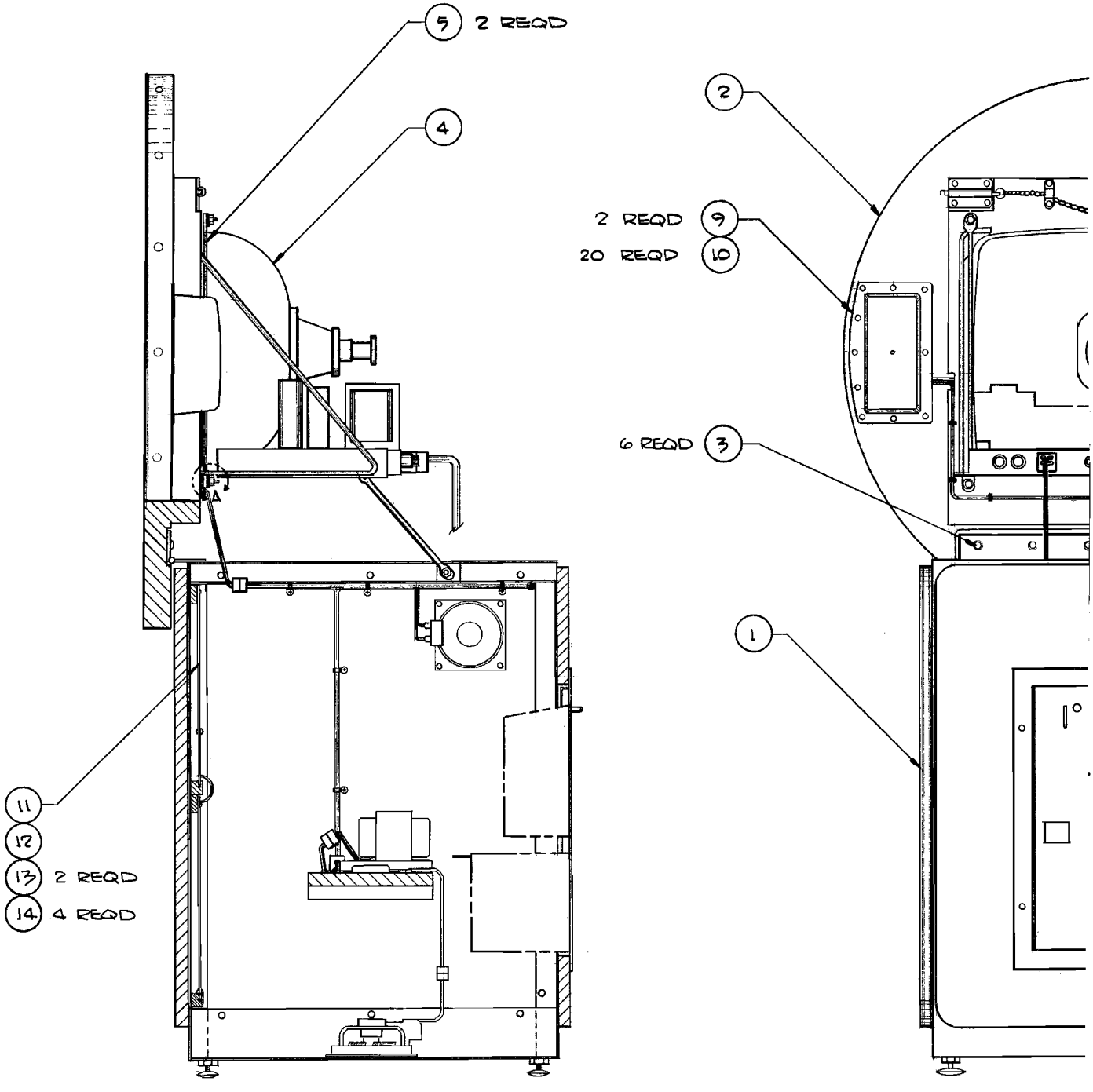
ASSEMBLY TITLE	TOP ASSEMBLY	P/L 003860

PARTS LIST SPECIFICATION — Page 1 of 1

Drawn		
Checked	Mech. Eng.	
Proj. Eng.	Elec. Eng	REV. B

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A	PROD REL						
B	Rev per ECN #1525						

Item	Part Number	Qty.	DESCRIPTION
1	A003858	1	Lower Cabinet Assembly
2	A003856	1	Table Top Assembly
3	75-2112S	6	Screw, Mach., Rd. Hd., Cross-Recessed #10-24 x 3/4"Lg.
4	002462	1	T.V. Monitor Modification Detail
5	003694	2	Tie Bar
6	75-015S	4	Washer, Flat, Reg. Pattern, Steel, #¼
7	75-045	4	Washer, Split-Lock, Cres., #¼
8	75-915S	4	Nut, Mach., Hex Hd., Standard Pattern, #¼-20
9	003850	2	Cover, Joystick
10	82-1608	20	Screw, Flat Head, #6 x ½" Lg.
11	A003110	1	P.C. Assembly, Panzer Board #1
12	A003112	1	P.C. Assembly, Panzer Board #2
13	001141	2	Foam Pad
14	72-6608	4	Screw, S.M. Pan Hd #6 x ½ Lg.
15	004010	1	Cash Door, Plex, 50¢



SECTION "B-B"

C.T. TANK

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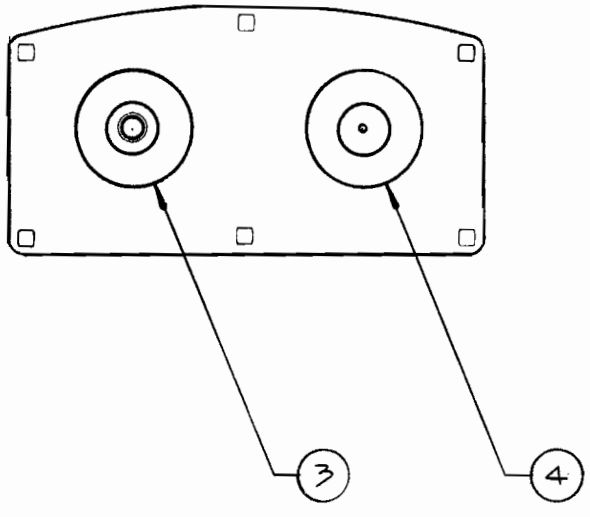
ASSEMBLY TITLE	JOYSTICK ASSEMBLY	P/L 003857

PARTS LIST SPECIFICATION — Page 1 of 1

Drawn		
Checked	Mech. Eng.	
Proj. Eng.	Elec. Eng	REV. A

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A	PROD REL						

Item	Part Number	Qty.	DESCRIPTION
1	003851	1	Panel, Support
2	003849	1	Plate, Mounting, Joystick
3	A002303-05	1	Joystick Assembly with Button
4	A002303-04	1	Joystick Assembly without Button



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A003856

NEXT ASSY

APPL

2 1

REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
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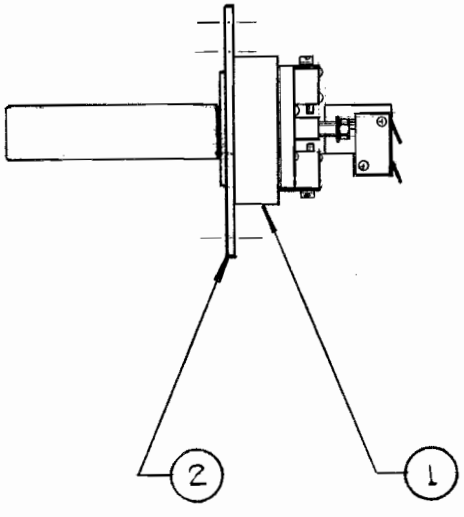
A	PROD REL			

D

C



B

A

INTERPRET THIS DRAWING PER USASI Y14.5	DRAWN BY DATE	ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: FRACTIONS = ±1/16 .x = ±.1 ANGLES = ±1° .xx = ± .03 SURFACE FINISH ✓ .xxx = ± .010	CHECKED		
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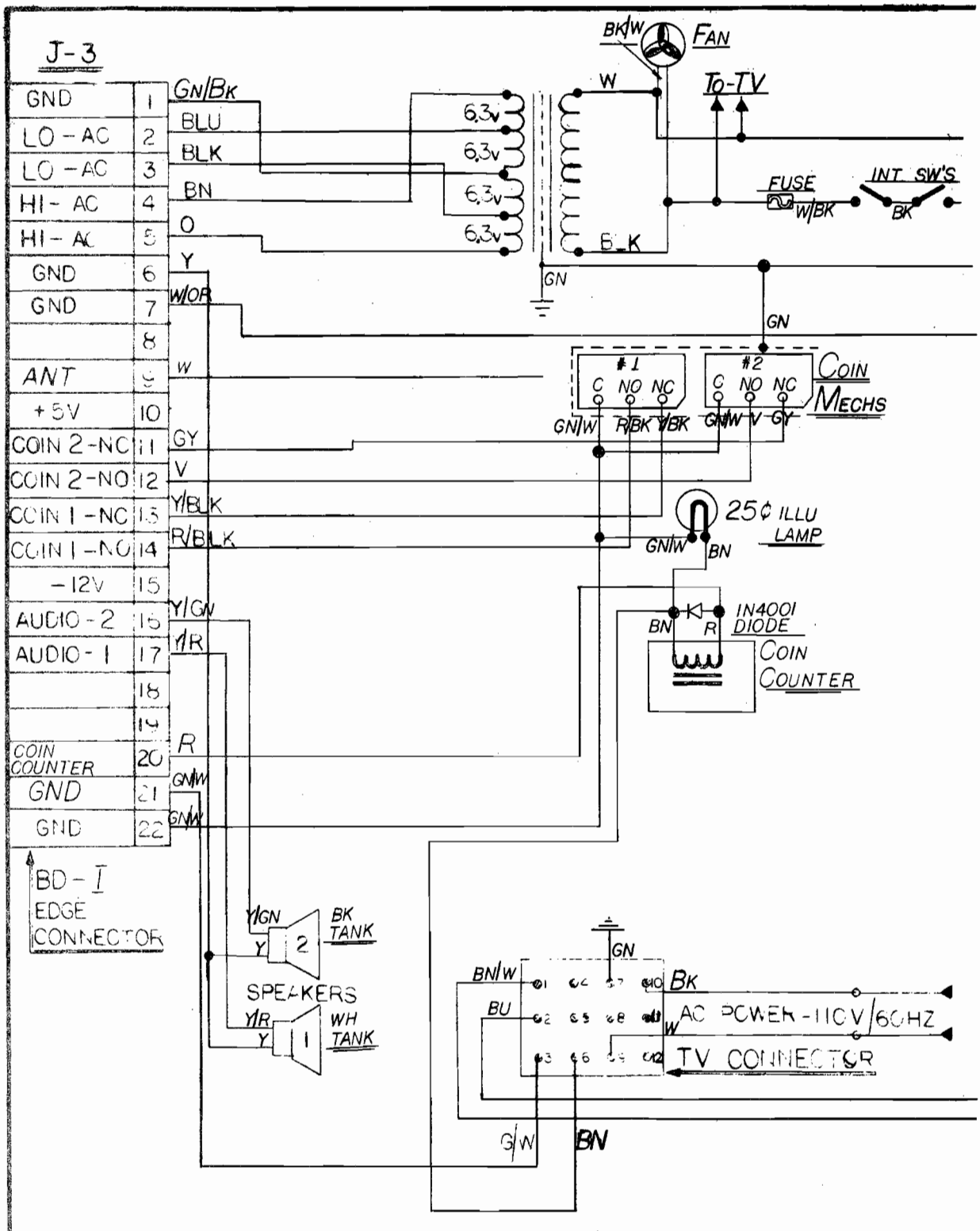
MATERIAL: SEE PL 003857	DOCUMENT CONTROL		
C.T. TAUK	APPROVED	SIZE C / DRAWING NO. A003857 / REV A	
USED ON		SCALE 1/2	SHEET 1 OF 1
ATION			

2 1



REVISIONS			
SYM	DESCRIPTION	INITIALS and DATE	
		DRFTG	CHECK
A			

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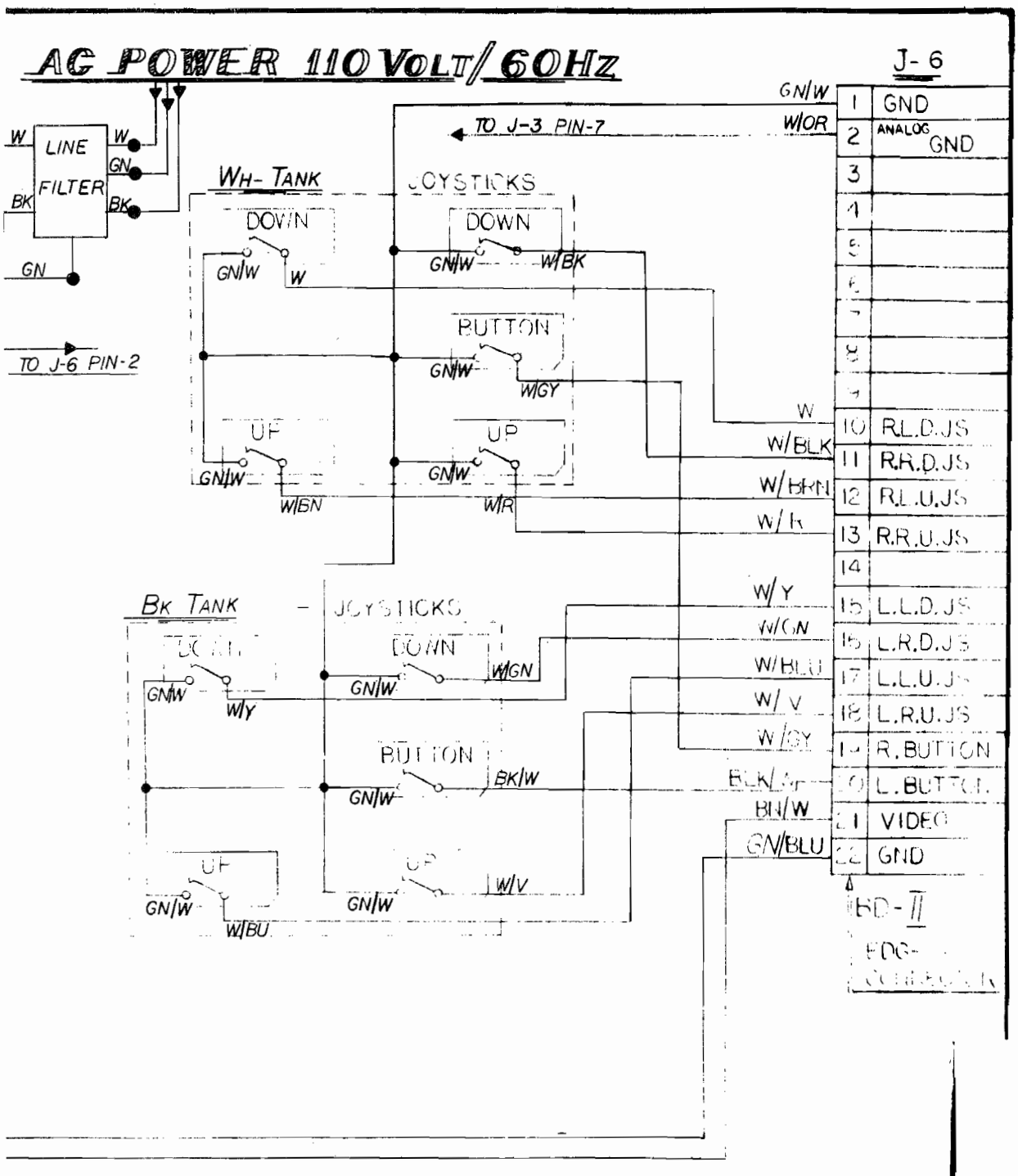
NEXT ASSY

APPI



INTERPRET THIS DRAWING PER USASI Y14.5	DRAWN BY DATE	ATARI INCORPORATED 14600 Winchester Boulevard Los Gatos, California 95030	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: FRACTIONS = ±1/16 .x = ±.1 ANGLES = ±1° .xx = ±.03 SURFACE FINISH ✓ .xxx = ±.010	CHECKED		
	DESIGN, ENGINEER	TITLE COCKTAIL TABLE - TANK HARNESS SCHEMATIC	
MATERIAL:	PROJECT ENGINEER		
USED ON	DOCUMENT CONTROL	SIZE C DRAWING NO. 004032 REV A	
CATION	APPROVED	SCALE SHEET OF	

A

C.T. TANK

ATARI
Innovative leisure

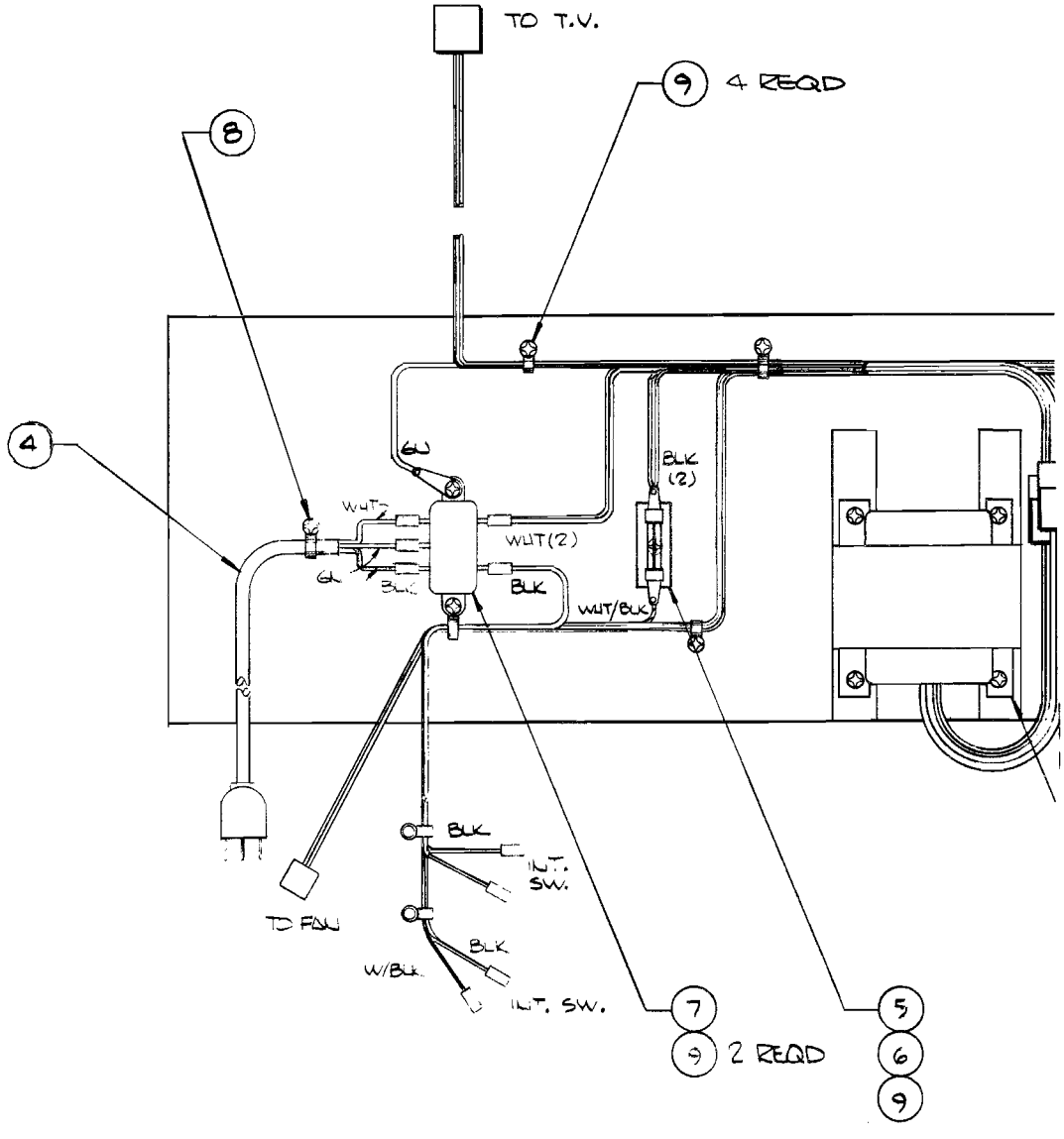
ASSEMBLY TITLE / ELECTRONICS TRAY ASSEMBLY **P/L** 003861

PARTS LIST SPECIFICATION Page 1 of 1

Drawn		
Checked	Mech. Eng.	
Proj. Eng.	Elec. Eng	REV.

Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
A	PROD REL						
B	[illegible]						

Item	Part Number	Qty.	DESCRIPTION
1	003859	1	Electronics Tray
2	004027	1	Main Harness
3	A003560-1	1	Transformer Assembly
4	A004244	1	Power Cord Assy
5	46-202201	1	Fuse, 2 AMP, 125V
6	A003460	1	AC Power Harness
7	90-3001	1	Filter, Power Line
8	78-25002	2	Screw Down Tie Wrap
9	72-6608	9	Screw, SM, Pan Hd, Phil, #6 x ½ Lg
10	72-6824	4	Screw, SM, Pan Hd, Phil, #8 x 1½ Lg



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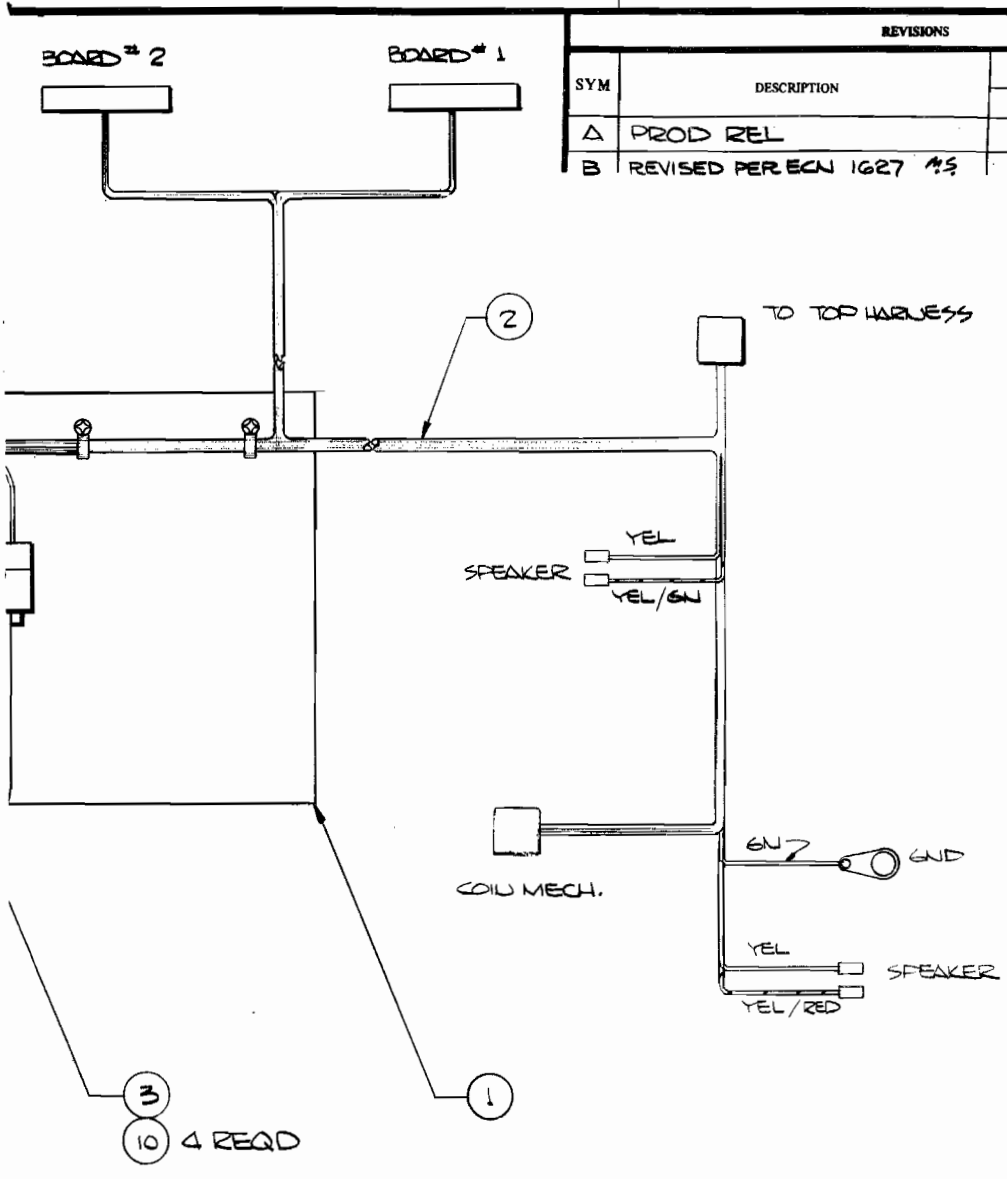

REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRFTG	CHECK	ENGRG
A	PROD REL			
B	REVISED PER ECN 1627 MS			

D

C

B

A

DRAWING NO. A003861 | SHEET 1 | REV B

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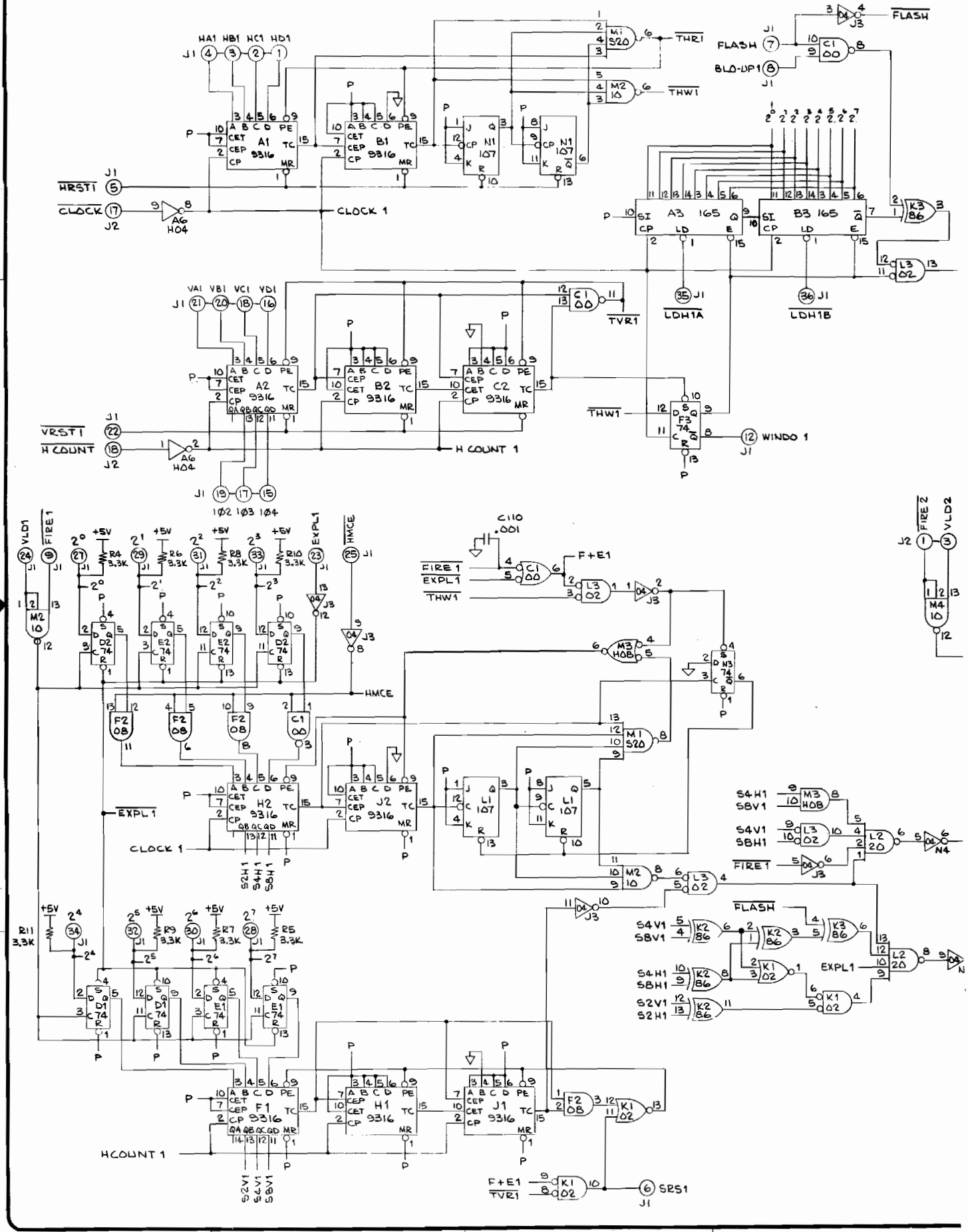
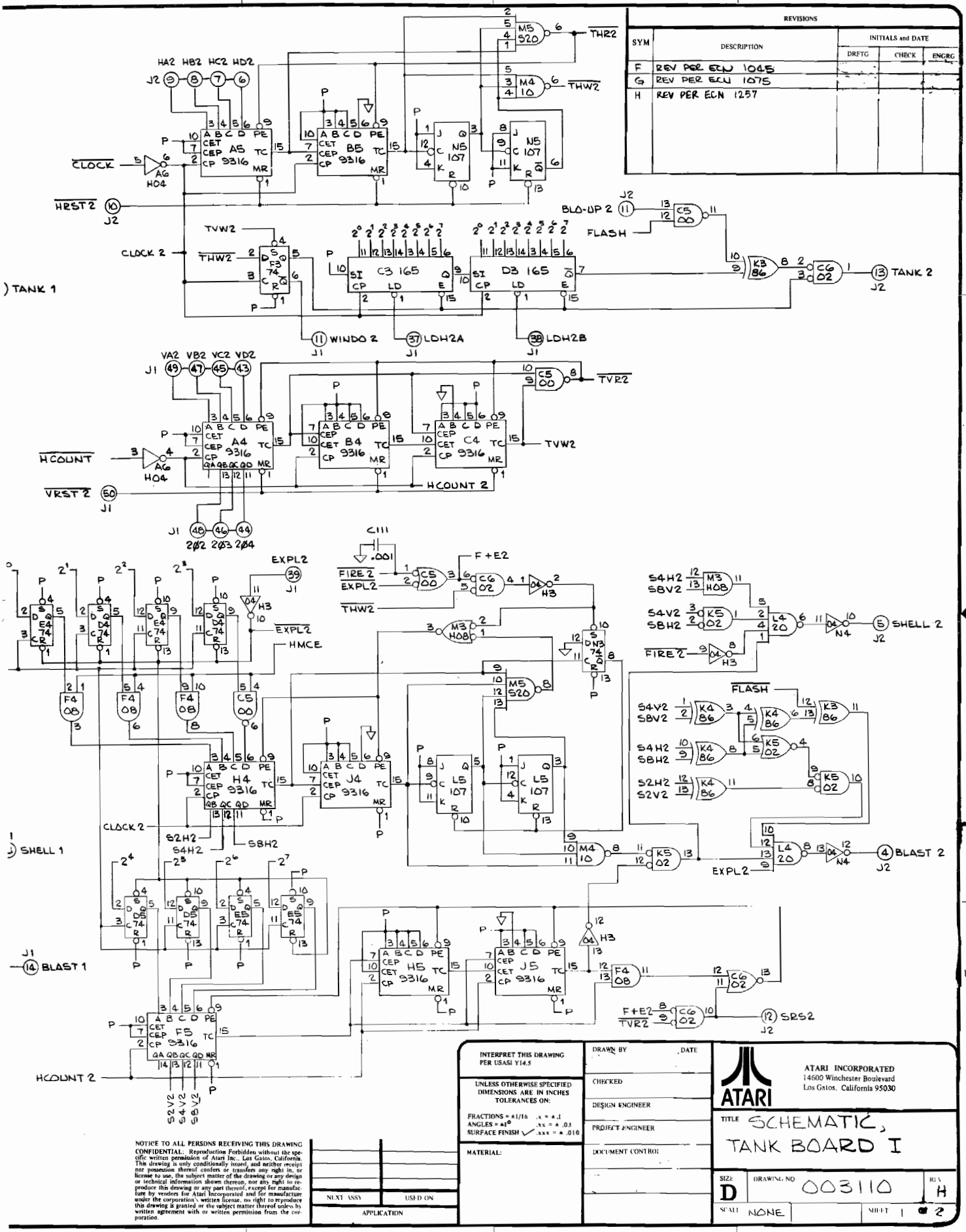
MATERIAL: SEE PL 003861	DOCUMENT CONTROL	SIZE C | DRAWING NO. A003861 | REV B	
558 C.T. TANK SY USED ON APPLICATION		SCALE | SHEET 1 OF 1	


8
7
6
5
D
C
B
A
HA1 HB1 HC1 HD1
J1
HRST1
CLOCK
J2
A6
H04
A1 9316
B1 9316
N1 107
M1 S20
M2 10
THR1
THW1
CLOCK 1
FLASH
BLD-DP1
C1 00
J3
A3 165
B3 165
K3 86
L3 02
VA1 VB1 VC1 VD1
A2 9316
B2 9316
C2 9316
TVR1
LDH1A
LDH1B
VRST1
H COUNT
H COUNT 1
F3 74
WINDO 1
1Ø2 1Ø3 1Ø4
VLD1
FIRE1
EXPL1
HMCE
+5V
R4 3.3K
R6 3.3K
R8 3.3K
R10 3.3K
D2 74
E2 74
F2 08
C110 .001
F+E1
FIRE 1
EXPL1
THW1
M3 H08
N3 74
FIRE2
VLD2
M4 10
H2 9316
J2 9316
L1 107
EXPL 1
CLOCK 1
S4H1
S8V1
S4V1
S8H1
L2 20
N4
R11 3.3K
R9 3.3K
R7 3.3K
R5 3.3K
D1 74
E1 74
F1 9316
H1 9316
J1 9316
K2 86
K1 02
HCOUNT 1
S2V1
S4V1
S8V1
S2H1
F+E1
TVR1
SBS1


REVISIONS
SYM | DESCRIPTION | INITIALS and DATE | DRFTG | CHECK | ENGRG
F | REV PER ECN 1045
G | REV PER ECN 1075
H | REV PER ECN 1257
CLOCK
HRST2
CLOCK 2
TVW2
THW2
HA2 HB2 HC2 HD2
VA2 VB2 VC2 VD2
HCOUNT
VRST2
HCOUNT 2
TVW2
TVR2
THR2
THW2
BLO-UP 2
FLASH
TANK 1
TANK 2
WINDO 2
LDH2A
LDH2B
EXPL2
FIRE 2
F+E2
HMCE
SHELL 1
SHELL 2
BLAST 1
BLAST 2
SRS2
S2H2
S4H2
S2V2
S4V2
S8H2
S8V2
INTERPRET THIS DRAWING PER USASI Y14.5
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FRACTIONS ± 1/16 .x = ±.1
ANGLES = ±1° .xx = ± .03
SURFACE FINISH ✓ .xxx = ± .010
MATERIAL:
DRAWN BY
DATE
CHECKED
DESIGN ENGINEER
PROJECT ENGINEER
DOCUMENT CONTROL
NEXT ASSY
USED ON
APPLICATION
ATARI INCORPORATED
14600 Winchester Boulevard
Los Gatos, California 95030
TITLE SCHEMATIC, TANK BOARD I
SIZE D
DRAWING NO 003110
REV H
SCALE NONE
SHEET 1 of 2
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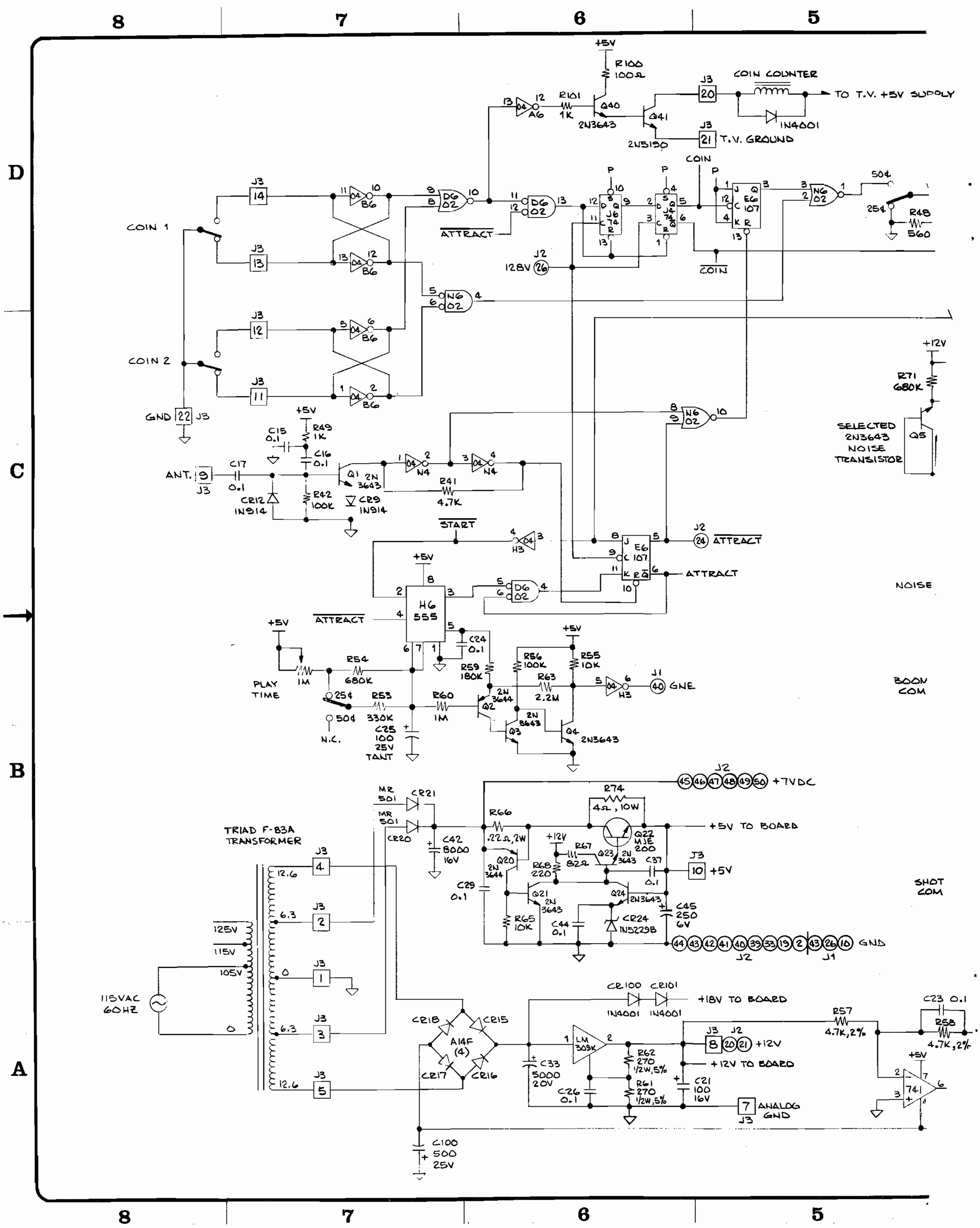
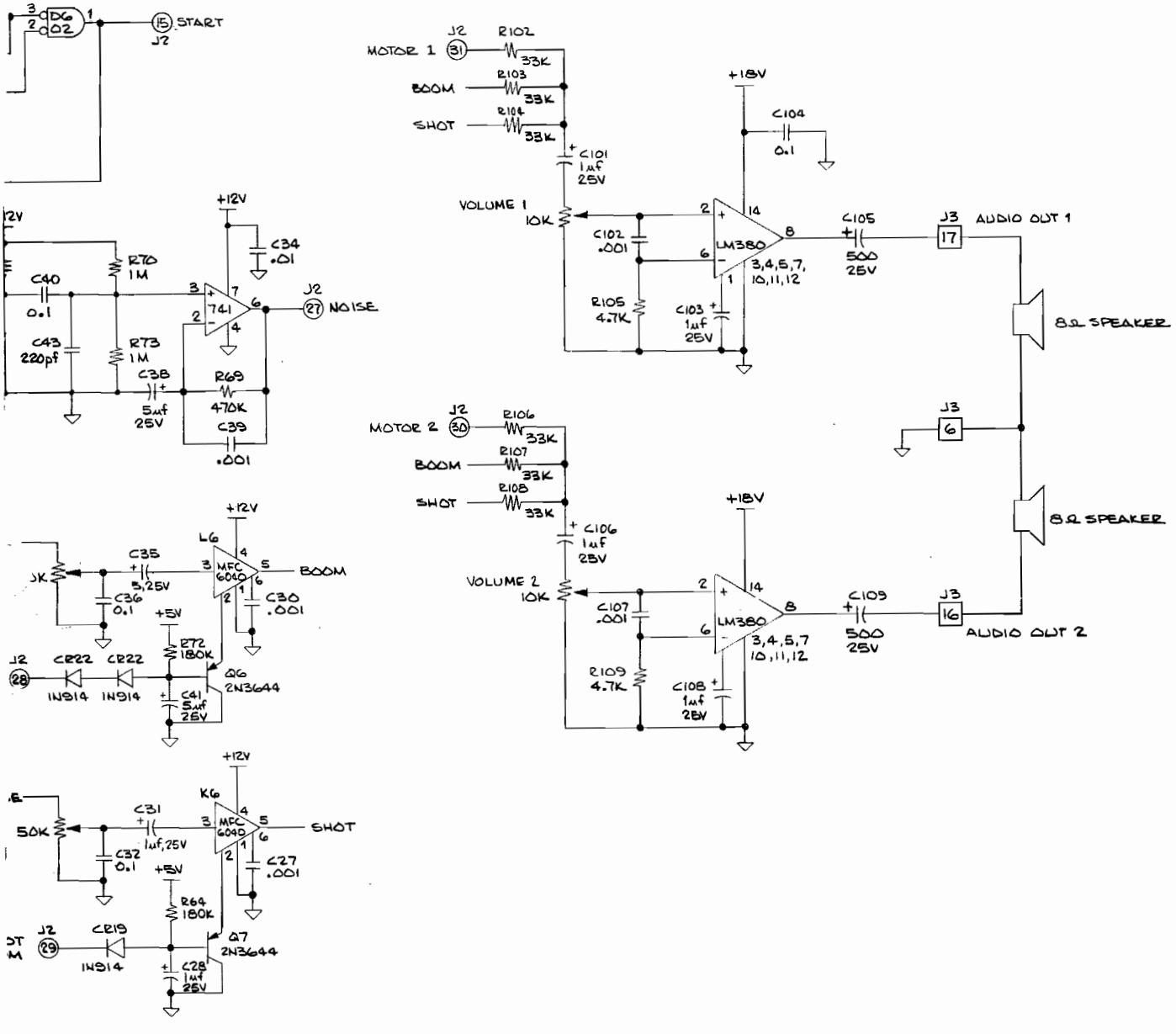


8
7
6
5
D
C
B
A
+5V
R100
100Ω
COIN COUNTER
TO T.V. +5V SUPPLY
1N4001
T.V. GROUND
R101
1K
Q40
2N3643
Q41
2N5190
COIN
COIN 1
COIN 2
GND
ATTRACT
128V
50¢
25¢
R48
560
+12V
R71
680K
SELECTED 2N3643 NOISE TRANSISTOR
Q5
ANT.
C17
0.1
C15
0.1
C16
0.1
R49
1K
Q1
2N 3643
R42
100K
CR12
IN914
CR9
IN914
R41
4.7K
START
NOISE
H6
555
C24
0.1
PLAY TIME
R54
680K
R53
330K
C25
100
25V
TANT
N.C.
R60
1M
R59
180K
R56
100K
R55
10K
R63
2.2M
GNE
BOOM COM
Q2
2N 3644
Q3
2N 3643
Q4
2N3643
+7VDC
R74
4Ω, 10W
MR 501
CR21
CR20
R66
.22Ω, 2W
Q22
MJE 200
+5V TO BOARD
C42
8000
16V
TRIAD F-83A TRANSFORMER
R67
82Ω
Q23
2N 3643
C37
0.1
R68
220
Q20
2N 3644
C29
0.1
Q21
2N 3643
Q24
2N3643
C45
250
6V
SHOT COM
R65
10K
C44
0.1
CR24
1N5229B
GND
125V
115V
105V
12.6
6.3
115VAC 60HZ
CR100
CR101
+18V TO BOARD
1N4001
R57
4.7K, 2%
C23 0.1
R58
4.7K, 2%
CR18
CR15
A14F (4)
CR17
CR16
C33
5000
20V
LM 309K
R62
270
1/2W, 5%
R61
270
1/2W, 5%
C26
0.1
+12V
+12V TO BOARD
C21
100
16V
ANALOG GND
741
C100
500
25V

REVISIONS				
SYM	DESCRIPTION	INITIALS and DATE		
		DRFTG	CHECK	ENGRG



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NEXT ASSY	USED ON
APPLICATION	

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SURFACE FINISH ✓ .xxx = ±.010

MATERIAL:

	DRAWN BY	DATE
	CHECKED	
	DESIGN ENGINEER	
	PROJECT ENGINEER	
	DOCUMENT CONTROL	
	APPROVED	

ATARI INCORPORATED
14600 Winchester Boulevard
Los Gatos, California 95030

TITLE SCHEMATIC, TANK BOARD I

SIZE	DRAWING NO.	REV
D	003110	H
SCALE		SHEET 2 OF 2

TANK

ATARI
Innovative leisure

ASSEMBLY TITLE / TANK - BOARD 1 **P/L003110**

PARTS LIST SPECIFICATION Page 1 of 2

Drawn		
Checked	Mech. Eng.	
Proj. Eng.	Elec. Eng	REV. H

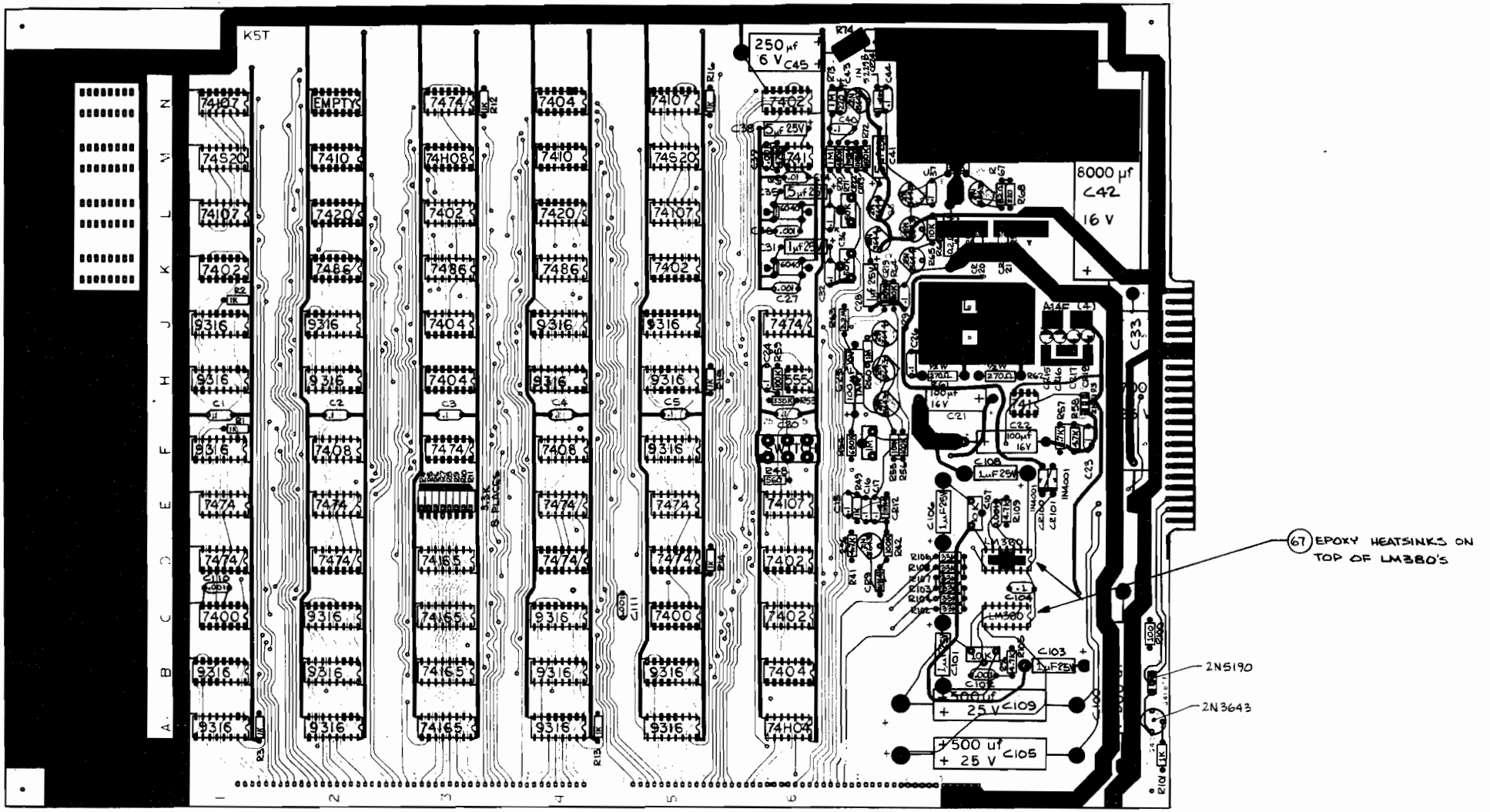
Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
D	PROTO	11-22					
D	Incorporates ECN 74-120	11-26					
D	Incorporates ECN 74-124	12-14					
F	REV PER ECN 1045	1/13/75					
G	REV PER ECN 1077	3/					
H	Rev per ECN 1257	3/21/75					

Item	Part Number	Qty.	DESCRIPTION
1	37-7400	2	Integrated Circuit, 7400
2	37-7402	6	" " 7402
3	37-7404	4	" " 7404
4	37-74H04	1	" " 74H04
5	37-7408	2	" " 7408
6	37-74H08	1	" " 74H08
7	37-7410	2	" " 7410
8	37-7420	2	" " 7420
9	37-74S20	2	" " 74S20
10	37-7474	11	" " 7474
11	37-7486	3	" " 7486
12	37-74107	5	" " 74107
13	37-74165	4	" " 74165
14	37-9316	20	" " 9316
15	37-555	1	" " 555
16	37-741	2	" " 741
17	37-LM380	2	" " LM380
18	37-MFC6040	2	" " MFC 6040
19	37-LM309	1	LM 309 K, Voltage Regulator
20	10-5101	1	Resistor, Carbon, 5%, ¼ Watt, 100 ohm
21	10-5102	10	" " " " 1K ohm
22	10-5103	2	" " " " 10K ohm
23	10-5104	3	" " " " 100K ohm
24	10-5105	3	" " " " 1Meg ohm
25	10-5221	1	" " " " 220 ohm
26	10-5225	1	" " " " 2.2M ohm
27	10-5333	6	" " " " 33K ohm
28	10-5472	3	" " " " 4.7K ohm
29			
30	10-5474	1	" " " " 470K ohm
31	10-5561	1	" " " " 560 ohm
32			
33			
34	10-5684	2	" " " " 680K ohm
35	10-5820	1	" " " " 82 ohm
36			
37	10-5334	1	" " " " 330K ohm
38	14-2472	2	" " 2% " 4.7K ohm
39	11-5271	2	Resistor, Carbon, 5%, ½ Watt, 270 ohm

ASSEMBLY TITLE TANK - BOARD 1 **P/L 003110**

PARTS LIST SPECIFICATION

Item	Part Number	Qty.	DESCRIPTION Rev H
40			
41	13-5P22	1	Resistor, Carbon, 5%, ½ Watt, .22 ohm
42	19-808W4PO	1	Resistor, Wirewound, 20%, 10 Watt, 4 ohm
43	31-1N914	5	Diodes, 1N 914
44	31-1N4001	2	Diodes, 1N 4001
45	32-1N5229	1	Diodes, Zener, 1N 5229B, 4.3V, 5%, Motorola
46	31-MR501	2	Diodes, MR 501
47	34-2N3643	8	Transistor, 2N 3643
48	34-2N3644	4	Transistor, 2N 3644
49	34-2N5190	1	Transistor, 2N 5190
50	34-2N5193	1	Transistor, 2N 5193
51	34-MJE200	1	Transistor, MJE 200
52	19-311503	2	Trimpot, 50K
53	19-311103	2	Trimpot, 10K
54	19-311105	1	Trimpot, 1 Meg
55	27-120104	19	Capacitor, Ceramic Disc Bypass, .1 uf
56	27-101102	7	" " " .001 uf
57	24-250105	6	" Electrolytic, 1 uf, 25V
58	24-250505	3	" " 5 uf, 25V
59	24-160107	2	" " 100 uf, 16V
60	24-060257	1	" " 250 uf, 6V
61	24-250478	1	" " 4700 uf, 25V
62	24-200808	1	" " 8000 uf, 16V
63	28-101221	1	" Dipped Mica, 220 pf
64	29-001	1	" Tantalum, 100 uf, 10V
65	69-001	1	Switch, DPDT
66	78-06002	1	Heatsink, Thermalloy #6111B-66
67	[illegible]	2	HEATSINK, THERMALLOY #6011B
68	72-1610S	2	Screw, Machine, , Pan Hd., Phil., 6-32 x 5/8"
69	75-056	2	Washer, Lock, Internal Star, #6
70	75-916S	2	Nut, Machine, Hex, 6-32
71	72-1412S	2	Screw, Machine, , Pan Hd., Phil., 4-40 x 3/4"
72	75-044	2	Washer, Split Lock, #4
73	75-914S	2	Nut, Hex, 4-40
74	003111	1	Printed Circuit Board, #90124
75	10-5184	2	Resistor, Carbon, 5%, ¼W, 180K ohm
76	27-101103	1	Capacitor, Ceramic Disc, .01 uf
77	24-250507	3	Capacitor, Electrolytic, 500uf, 25V
78	10-5332	8	RESISTOR, CARBON, 5%, ¼W, 3.3K OHM
79	31-A14F	4	Diode, G.E. Type A14F


K5T
250 µf 6 V C45
8000 µf C42 16 V
EMPTY
67 EPOXY HEATSINKS ON TOP OF LM380'S
2N5190
2N3643
+500 uf + 25 V C109
+500 uf + 25 V C105

SYM	DESCRIPTION	DFTG	APPV
F	REV PER ECN 1045		
G	REV PER ECN 1075		
H	REV PER ECN 1257		

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TOLERANCES ON:
FRACTIONS = ±1/16 .x = ± .1
ANGLES = ±1° .xx = ± .03
SURFACE FINISH √ .xxx = ± .010

MATERIAL

DRAWN BY DATE

CHECKED

DESIGN ENGINEER

PROJECT ENGINEER

DOCUMENT CONTROL

APPROVED

ATARI

ATARI INCORPORATED
14600 Winchester Boulevard
Los Gatos, California 95030

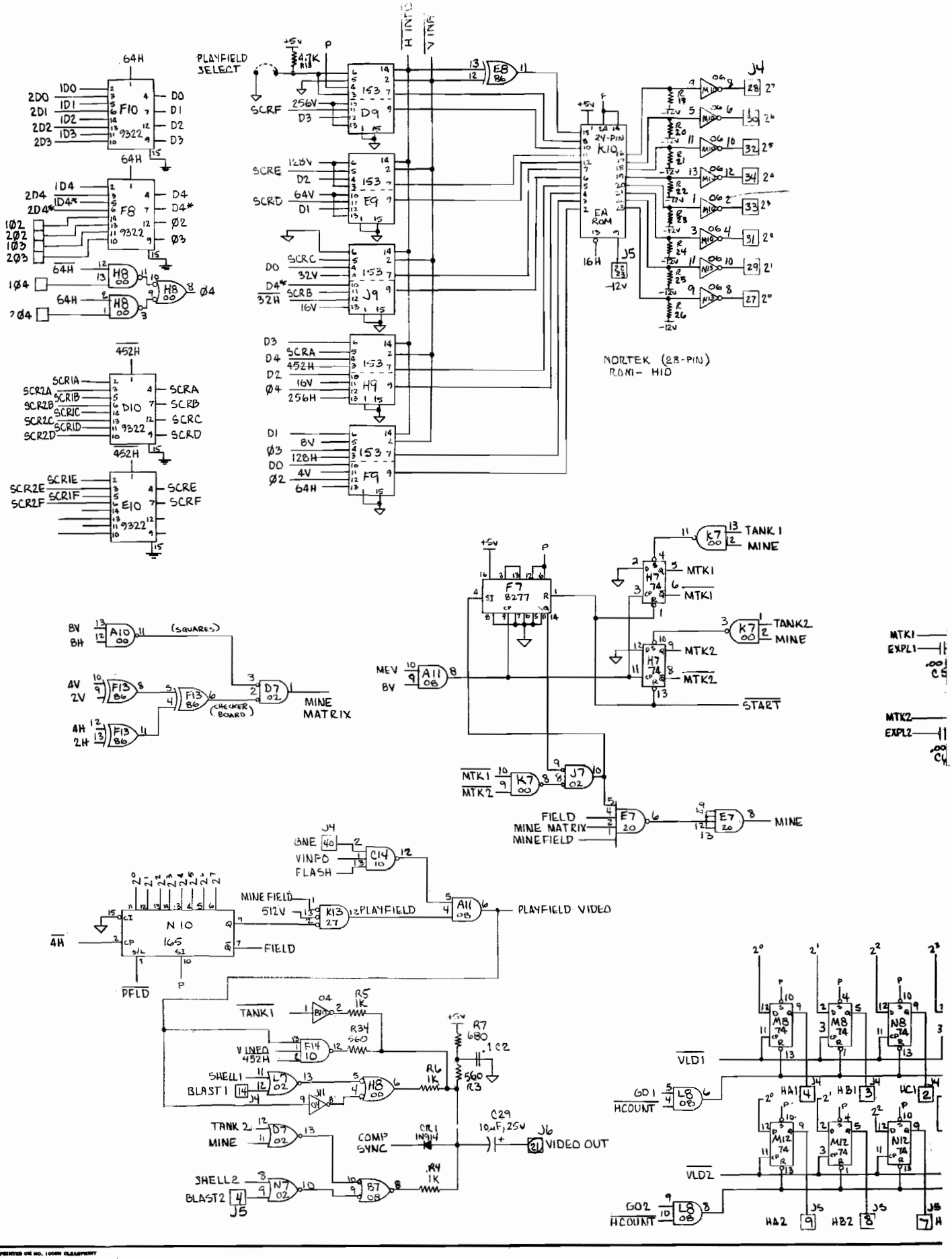
TITLE ASSEMBLY
TANK BD. I

SIZE D | DRAWING NO A003110 | H

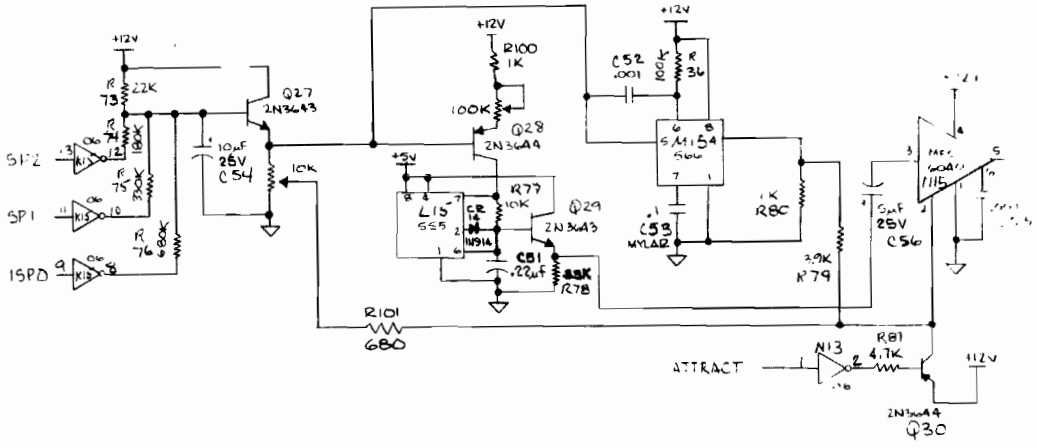
SCALE | SHEET 1 of 1

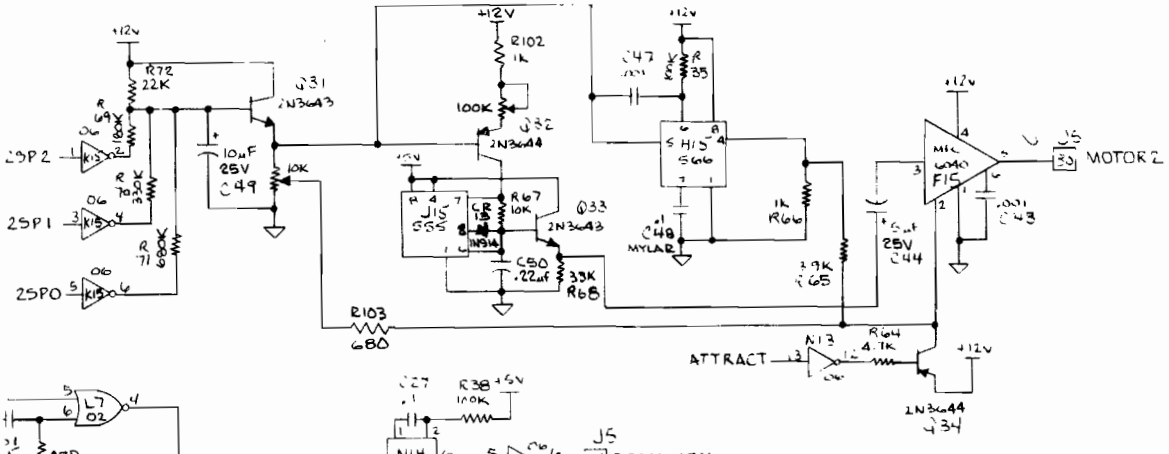
3 2 1

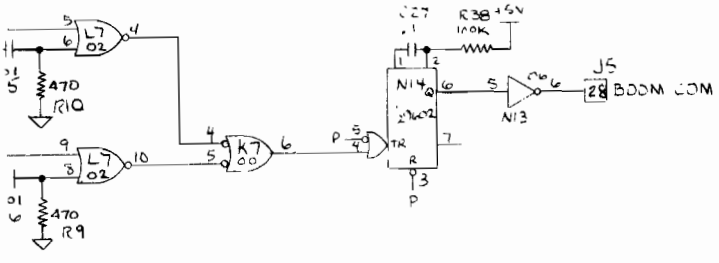
B A

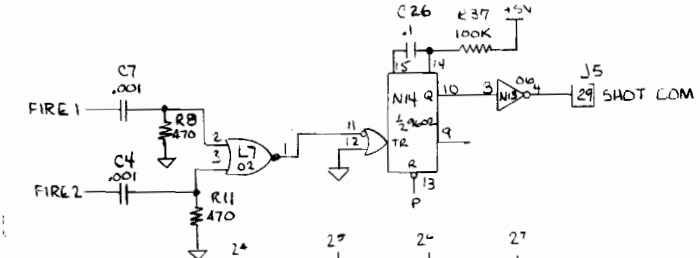

PLAYFIELD SELECT
SCRF
SCRE
SCRD
SCRC
SCRB
SCRA
NORTEK (28-PIN)
ROM- HID
MINE MATRIX
(SQUARES)
(CHECKER BOARD)
TANK 1 MINE
TANK 2 MINE
MTK1
MTK2
EXPL1
EXPL2
START
FIELD
MINEFIELD
PLAYFIELD
PLAYFIELD VIDEO
TANK1
TANK 2 MINE
SHELL1
BLAST1
SHELL2
BLAST2
COMP SYNC
VIDEO OUT
VLD1
VLD2
HCOUNT
HA1
HB1
HC1
HA2
HB2

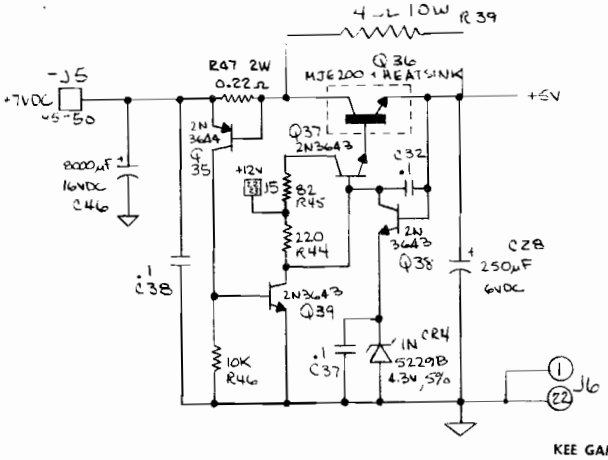
SYM	DESCRIPTION	DATE	APPD
F	REV PER ECN 1047		
G	REV PER ECN 1482		

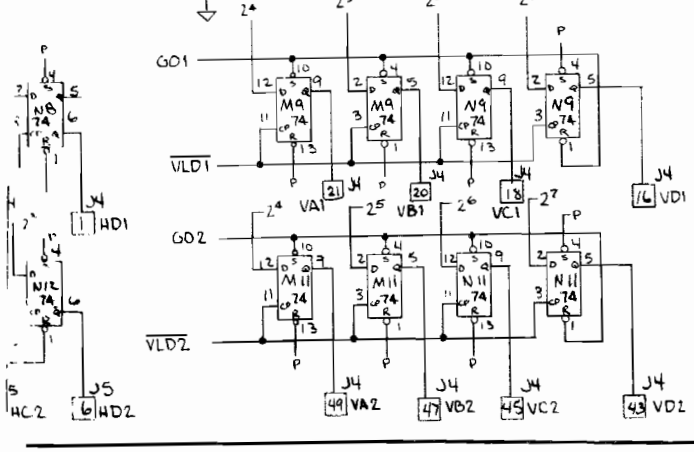






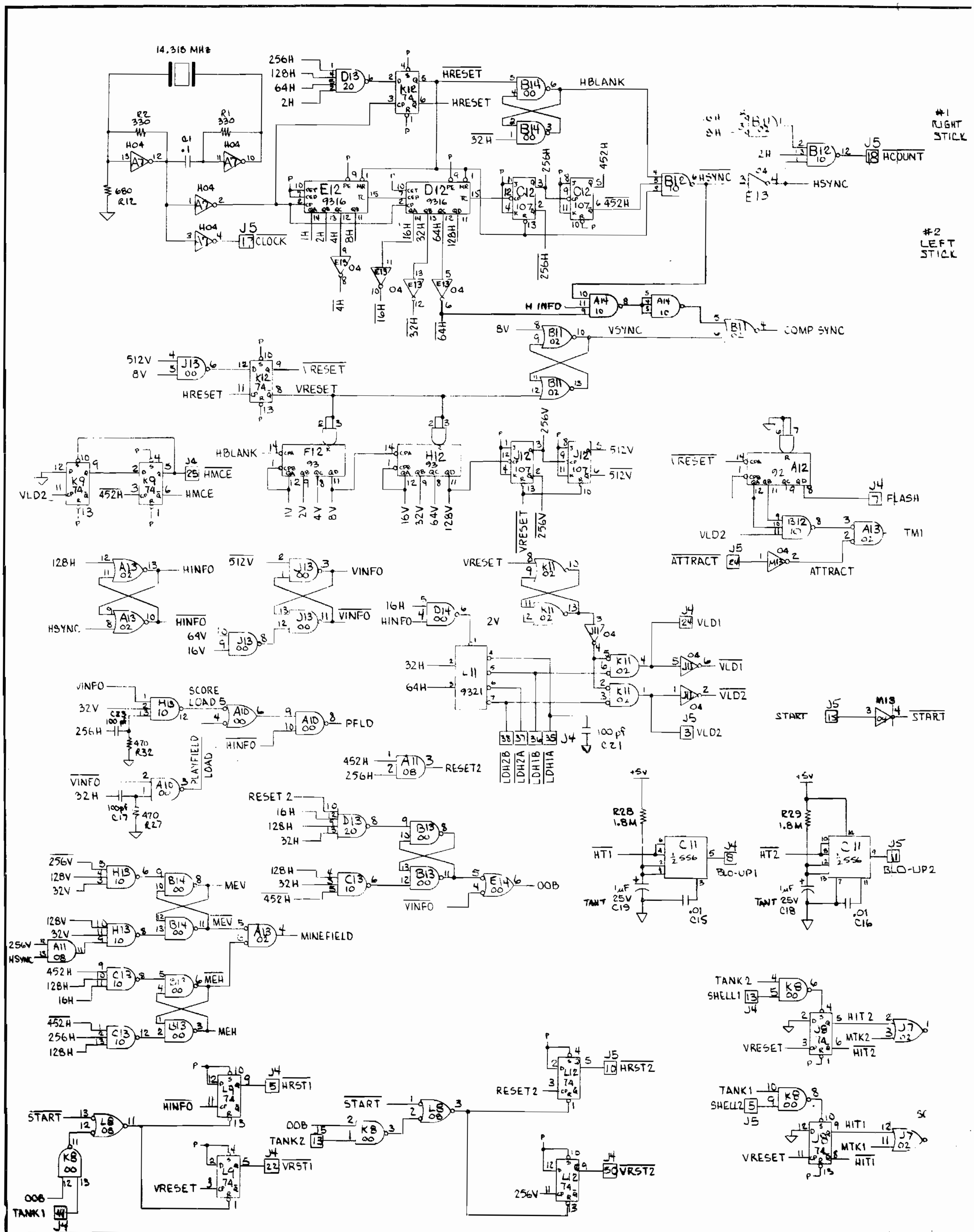




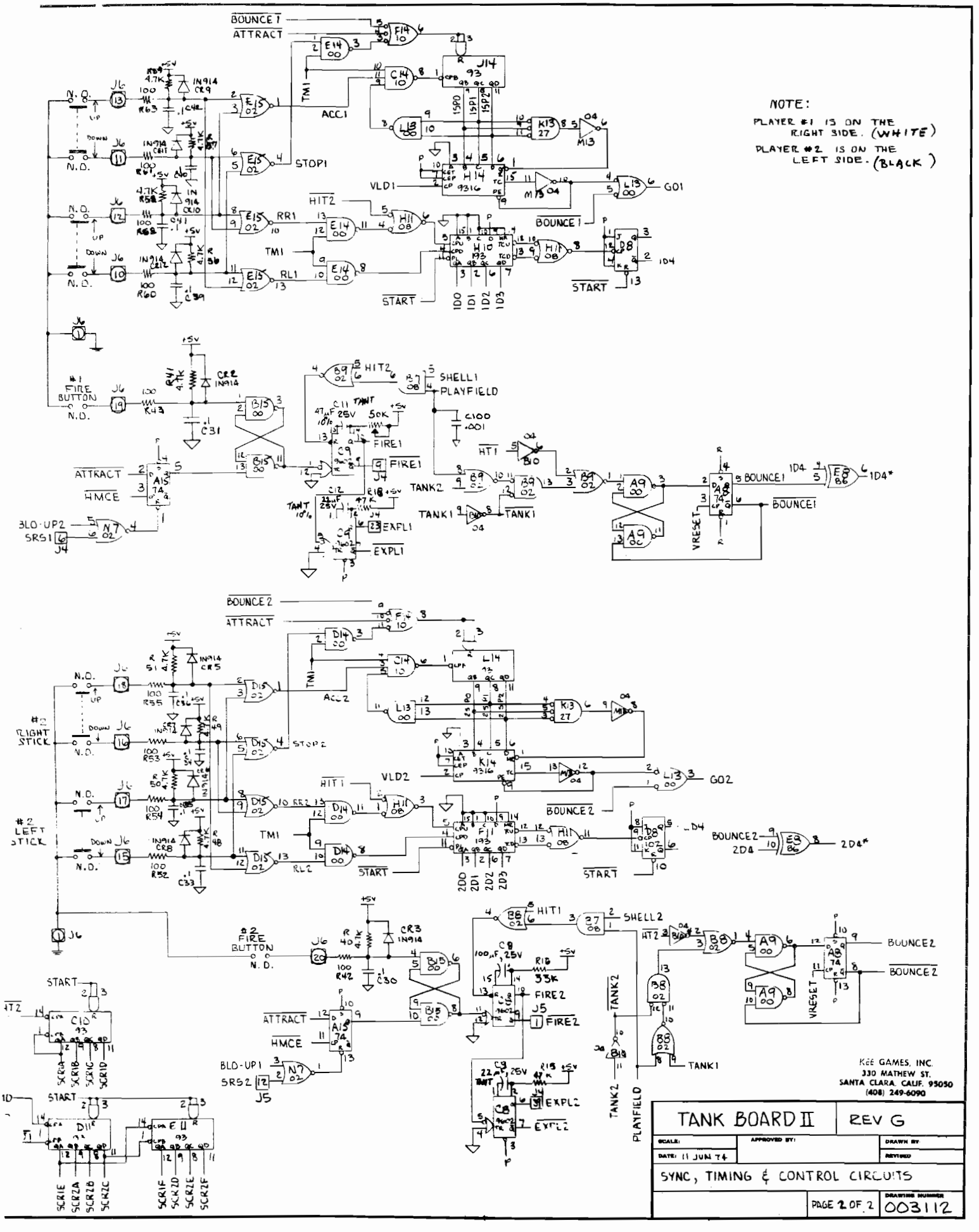


KEE GAMES, INC.
330 MATHEW ST.
SANTA CLARA, CALIF. 95050
(408) 249-6090

TANK BOARD II	REV G
SCALE:	APPROVED BY: / DRAWN BY
DATE: 18 JUNE 74	REVISED
ROM MUXING, PLAYFIELD, MINEFIELD, SOUND	
PAGE 2 OF 2	DRAWING NUMBER 003112



14.318 MHz
256H
128H
64H
2H
HRESET
HBLANK
32H
R2 330
R1 330
Q1 .1
680 R12
J5 17 CLOCK
E12 9316
D12 9316
C12 107
452H
HSYNC
#1 RIGHT STICK
#2 LEFT STICK
J5 18 HCOUNT
H INFO
COMP SYNC
8V
VSYNC
512V
VRESET
F12 93
H12 93
J12 107
HBLANK
J4 25 HMCE
HMCE
VLD2
A12 92
J4 7 FLASH
TM1
ATTRACT
J5 24
128H
HINFO
HSYNC
VINFO
64V
16V
2V
L11 9321
32H
64H
J4 24 VLD1
VLD1
VLD2
J5 3 VLD2
LDH2B
LDH2A
LDH1B
LDH1A
100 pF C21
START
J5 13
SCORE LOAD
PLAYFIELD LOAD
PFLD
470 R32
100pF C17
470 R27
452H
256H
RESET2
R28 1.8M
R29 1.8M
HT1
HT2
C11 1/2 556
J4 8 BLO-UP1
J5 11 BLO-UP2
1uF 25V TANT C19
1uF 25V TANT C18
.01 C15
.01 C16
16H
00B
MEV
MINEFIELD
MEH
256V
128V
32V
TANK 2
SHELL1
J4 13
HIT 2
MTK2
TANK1
SHELL2
J5 5
HIT1
MTK1
J4 5 HRST1
J4 22 VRST1
J5 10 HRST2
J4 30 VRST2
TANK2
J4 44


NOTE:
PLAYER #1 IS ON THE RIGHT SIDE. (WHITE)
PLAYER #2 IS ON THE LEFT SIDE. (BLACK)
BOUNCE1
ATTRACT
ACC1
STOP1
RR1
RL1
VLD1
GO1
HIT2
START
SHELL1
PLAYFIELD
FIRE1
EXPL1
TANK2
TANK1
BOUNCE2
VRESET
BOUNCE2
ATTRACT
ACC2
STOP2
VLD2
GO2
HIT1
RR2
RL2
START
SHELL2
FIRE2
EXPL2
TANK2
TANK1
PLAYFIELD
KEE GAMES, INC.
330 MATHEW ST.
SANTA CLARA, CALIF. 95050
(408) 249-6090
TANK BOARD II
REV G
DATE: 11 JUN 74
SYNC, TIMING & CONTROL CIRCUITS
PAGE 2 OF 2
003112

TANK

ATARI
Innovative leisure

ASSEMBLY TITLE / TANK - BOARD 2 **P/L 003112**

PARTS LIST SPECIFICATION Page 1 of 2

Drawn		
Checked	Mech. Eng.	
Proj. Eng.	Elec. Eng	REV. G

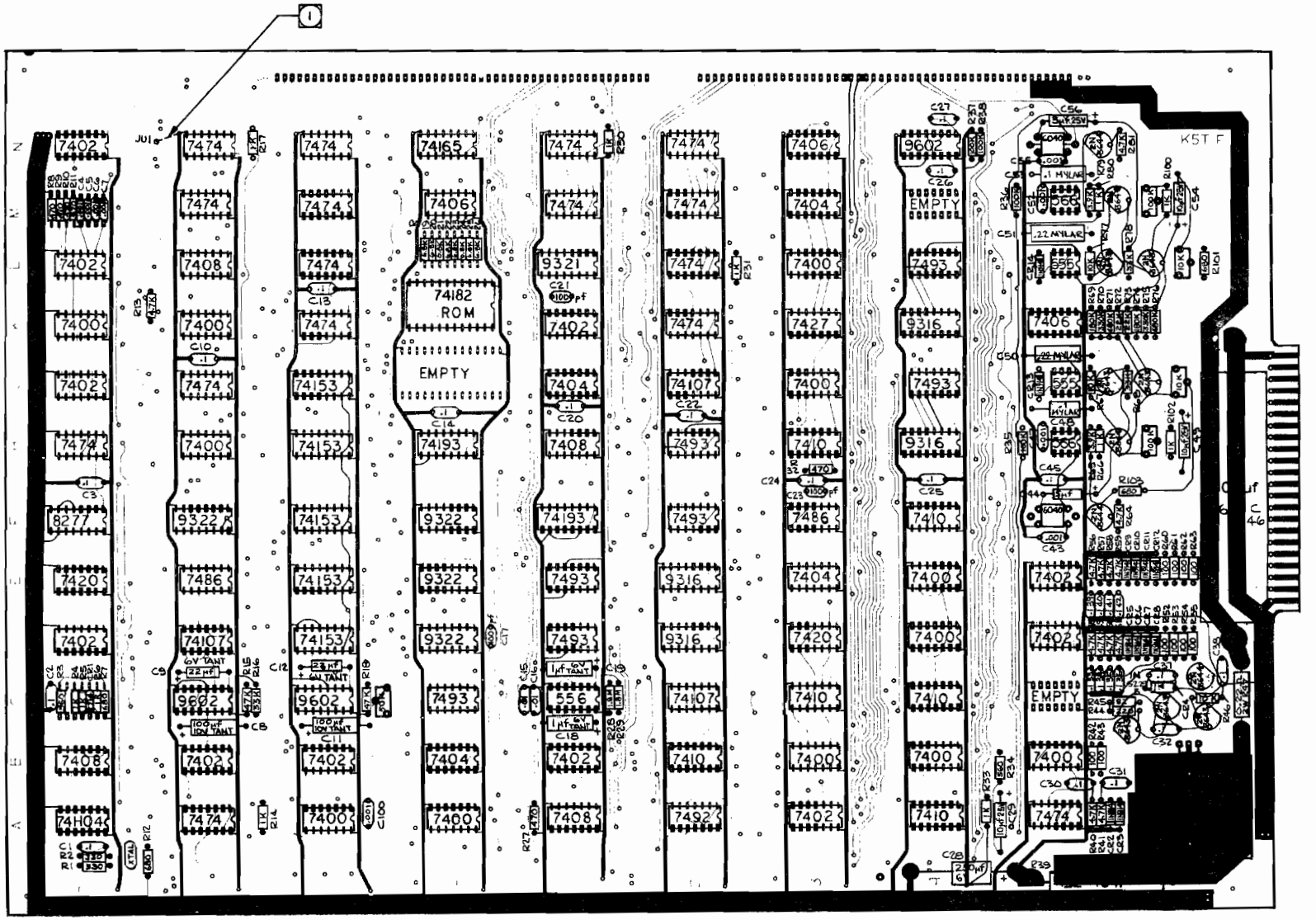
Rev.	Description	Date	Apprv.	Rev.	Description	Date	Apprv.
D	PROD REL	11-22					
D	Incorporates ECN 74-120	11-26					
D	Incorporates ECN 74-122	12-11					
F	PER ECN 1047	7/13/75					
G	PER ECN 1482						

Item	Part Number	Qty.	DESCRIPTION
1	37-7400	12	Integrated Circuit, 7400
2	37-7402	11	" " 7402
3	37-7404	4	" " 7404
4	37-74H04	1	" " 74H04
5	37-7406	3	" " 7406
6	37-7408	4	" " 7408
7	37-7410	6	" " 7410
8	37-7420	2	" " 7420
9	37-7427	1	" " 7427
10	37-7474	16	" " 7474
11	37-7486	2	" " 7486
12	37-7492	1	" " 7492
13	37-7493	7	" " 7493
14	37-74107	3	" " 74107
15	37-74153	5	" " 74153
16	37-74165	1	" " 74165
17	90-2006	1	16K Tank Rom E.A. #4800SD
18	37-74193	2	Integrated Circuit, 74193
19	37-8277	1	" " 8277
20	37-9316	4	" " 9316
21	37-9321	1	" " 9321
22	37-9322	4	" " 9322
23	37-9602	3	" " 9602
24	37-555	2	" " 555
25	37-556	1	" " 556
26	37-566	2	" " 566
27	37-MFC6040	2	" " MFC 6040
28	10-5101	10	Resistor, Carbon, 5%, ¼ Watt, 100 ohm
29	10-5102	12	" " " " 1K ohm
30	10-5103	3	" " " " 10K ohm
31	10-5104	4	" " " " 100K ohm
32	10-5221	1	" " " " 220 ohm
33	10-5223	2	" " " " 22K ohm
34	10-5331	2	" " " " 330 ohm
35	10-5333	3	" " " " 33K ohm
36	10-5334	2	" " " " 330K ohm
37	10-5392	2	" " " " 3.9K ohm
38	10-5471	6	" " " " 470 ohm

ASSEMBLY TITLE TANK - BOARD 2 **P/L** 003112

PARTS LIST SPECIFICATION

Item	Part Number	Qty.	DESCRIPTION Rev
39	10-5472	14	Resistor, Carbon, 5%, ¼ Watt, 4.7K ohm
40	10-5473	1	" " " " 47K ohm
41	10-5561	2	" " " " 560 ohm
42	10-5681	4	" " " " 680 ohm
43	10-5682	8	" " " " 6.8K ohm
44	10-5820	1	" " " " 82 ohm
45	10-5184	2	" " " " 180K ohm
46	10-5185	2	" " " " 1.8M ohm
47	13-5P22	1	" " " 2 Watt, .22 ohm
48	19-808W4PO	1	" Wirewound, 20%, 10W, 4 ohm
49	31-1N914	13	Diode, 1N 914
50	32-1N5229	1	Diode, Zener, 1N 5229B, 4.3V, 5%, Motorola
51	34-2N3643	7	Transistor, 2N 3643
52	33-2N3644	5	Transistor, 2N 3644
53	34-MJE200	1	Transistor, MJE 200
54	19-311103	2	Trimpot, 10K
55	19-311503	1	Trimpot, 50K
56	90-101	1	Crystal, 14.31818 mhz
57	27-120104	26	Capacitor, Ceramic Disc Bypass, .1 uf
58	27-101103	2	" " " .01 uf
59	27-250105	9	" " " .001 uf
60	28-101101	3	" Dipped Mica, 100 pf
61	29-004	2	" Tantalum, 1 uf, 6V
62	29-003	2	" " 22 uf, 6V
63	29-001	2	" " 100 uf, 10V
64	21-101224	2	" Mylar, .22 uf
65	24-250505	2	" Electrolytic, 5 uf, 25V
66	24-250106	3	" " 10 uf, 25V
67	24-060257	1	" " 250 uf, 6V
68	24-200808	1	" " 8000 uf, 16V
69	79-42424	1	Socket, 24 pin
70	78-06002	1	Heatsink, Thermalloy #6111B-66
71	55-6125	4	Flex Strip Jumper, 25 Conductor, Ansley #FSN-23A
72	72-1412S	2	Screw, Machine, , Pan Hd., Phil., 4-40 x 3/4"
73	75-044	2	Washer, Split Lock, #4
74	75-914S	2	Nut, Hex 4-40
75	003113	1	Printed Circuit Board, #90125
76	10-5684	2	Resistor, Carbon, 5%, ¼W, 680K ohm
77	19311104	2	Trimpot, 100K ohm
78	21-101104	2	Capacitor, Mylar .1 uf
79	----------	1	Jumper, (30 AWG, Insulated)



NOTES:

1. JU1 IS AN OPTIONAL JUMPER FOR ALTERNATE PLAYFIELD (#30 AWG, INSULATED)

SYM	DESCRIPTION	DFTG	APPV
F	REV PER ECN 1047		
G	REV PER ECN 1482		

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NEXT ASSY | USED ON

APPLICATION

INTERPRET THIS DRAWING PER USASI Y14.5

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON:
FRACTIONS ± 1/16 .x = ± .1
ANGLES ± 1° .xx = ± .03
SURFACE FINISH √ .xxx = ± .010

MATERIAL:

DRAWN BY DATE

CHECKED

DESIGN ENGINEER

PROJECT ENGINEER

DOCUMENT CONTROL

APPROVE

ATARI INCORPORATED
14600 Winchester Boulevard
Los Gatos, California 95030

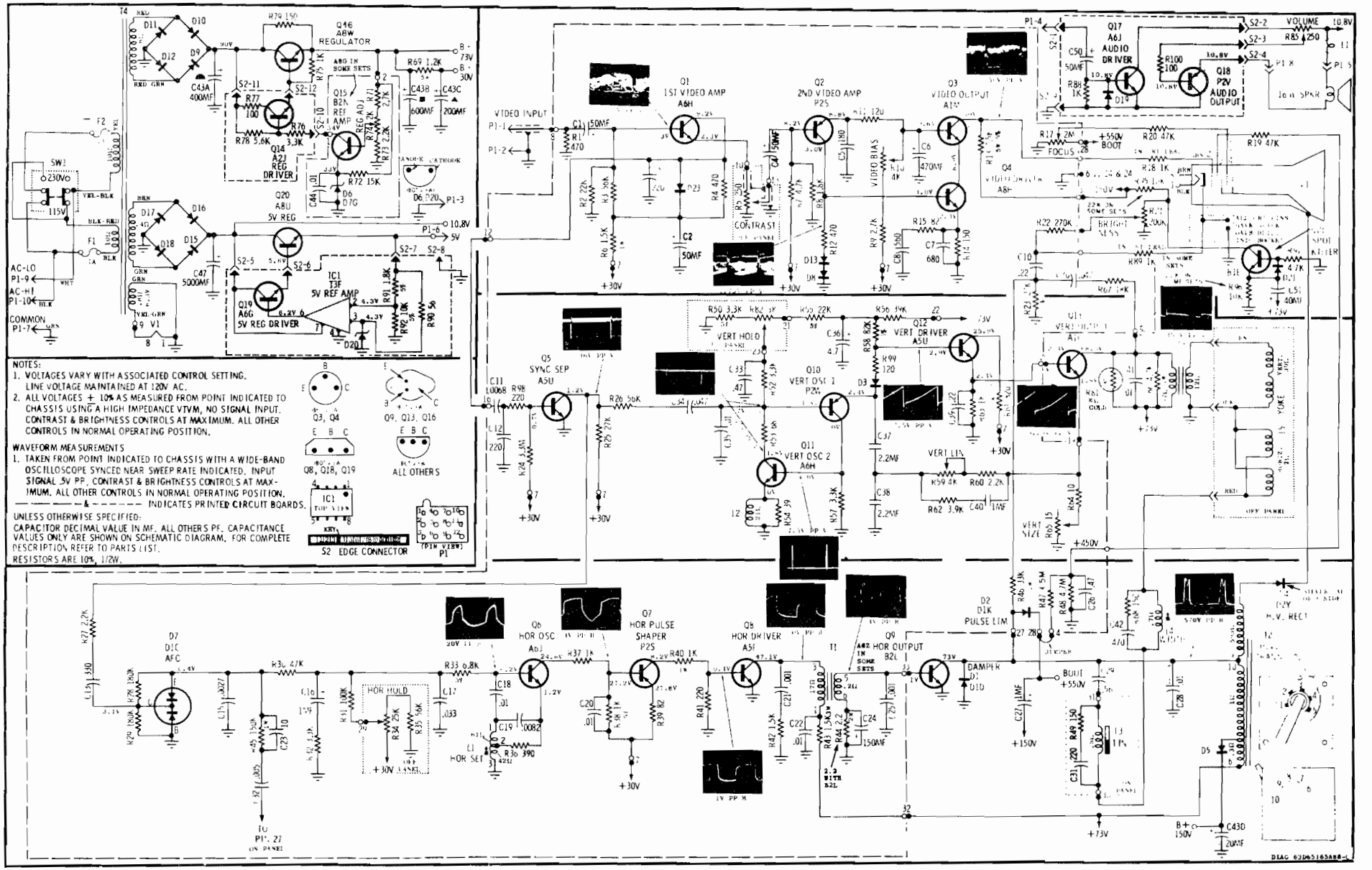
TITLE ASSEMBLY
TANK BD. II

SIZE D | DRAWING NO A003112 | REV G

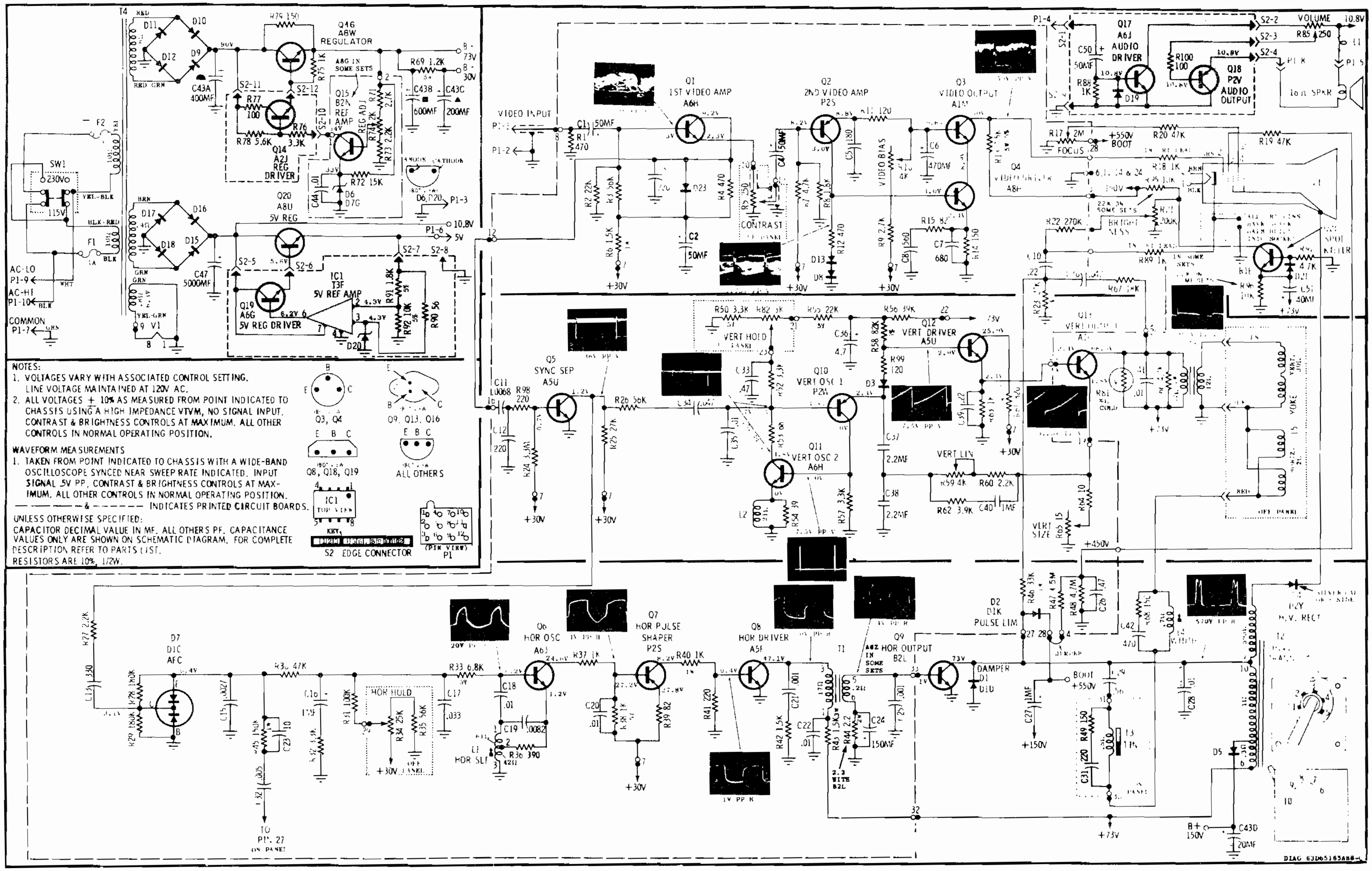
SCALE | SHEET 1 OF 1

3 2 1

B A



Schematic, Motorola XM501/XM701 Monitor



Schematic, Motorola XM501/XM701 Monitor

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Seller warrants that its printed circuit boards and parts thereon are free from defects in material and workmanship under normal use and service for a period of ninety (90) days from date of shipment. Seller warrants that its television monitors are free from defects in material and workmanship under normal use and service for a period of thirty (30) days from date of shipment. None of the Seller's other products or parts thereof are warranted.

If the products described in this manual fail to conform to this warranty, Seller's sole liability shall be, at its option, to repair, replace, or credit Buyer's account for such products which are returned to Seller during said warranty period, provided:

(a) Seller is promptly notified in writing upon discovery by Buyer that said products are defective;

(b) Such products are returned prepaid to Seller's plant; and

(c) Seller's examination of said products discloses to Seller's satisfaction that such alleged defects existed and were not caused by accident, misuse, neglect, alteration, improper repair, installation or improper testing.

In no event shall Seller be liable for loss of profits, loss of use, incidental or consequential damages.

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