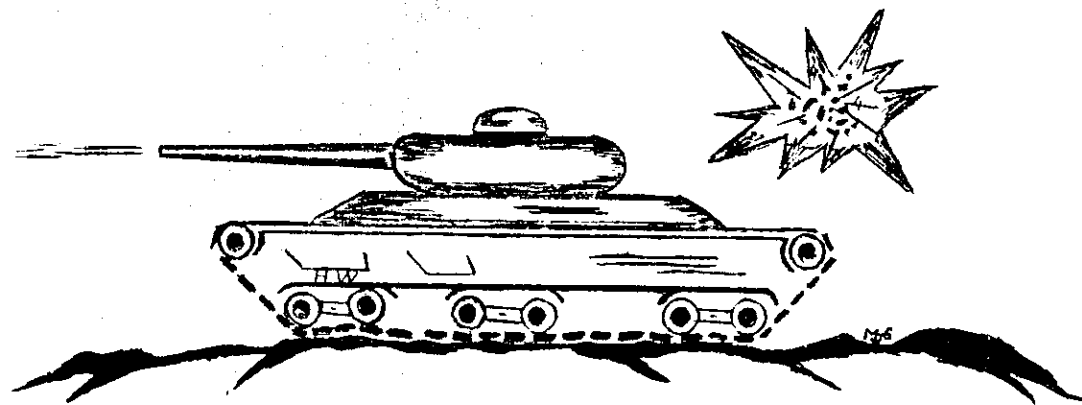
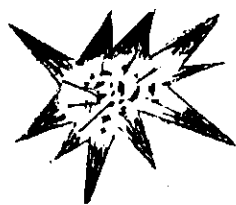


TANK



OPERATION AND SERVICE MANUAL



KEE GAMES

2175 Martin Ave.
Santa Clara, CA. 95051
(408) 249-6090

TO ALL OUR FRIENDS:

It is you, our friends and customers, who have helped to make KEE GAMES' hope for success come true.

With imagination, electronic skill - and with a sense of humor - we have created such great games as;

ELIMINATION !

SPIKE !

FORMULA K !

TWIN RACER !

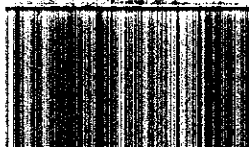
and, now . . . we proudly announce:

TANK !

A SUPER game for the "gamesters" to try their hand at!"

We want to thank you for helping us; and we KNOW that THIS great KEEnote game - TANK - will help you.

Thank you sincerely,
KEE GAMES, INC.
Gil Williams,
President



The motorola TV and Tank Circuit Boards have been designed to give you, the customer, the most trouble free unit possible. The circuits used are all solid state for long life and reliability.

Our games are designed with the customer in mind and we appreciate any and all comments from the field.

In the event your unit does require servicing, this manual will aid your efforts.

This manual consists of the following sections:

- I. Adjustments
- II. Diagnosis and Procedures
- III. Warranty and Service
- IV. Schematics

I. ADJUSTMENTS

There are two types of adjustments that can be made to your unit: TV & Circuit Boards.

The controls on the TV Monitor work as in any normal TV. Vertical Hold, Brightness, Contrast & Horizontal Hold. These are located on the back side of the monitor chassis. The vertical & horizontal hold controls should be set in the middle of their range. Turn control until picture tears or rolls, turn control back until picture tears or rolls in the opposite direction & then reset control to the middle of the stable range. The brightness & contrast should be set at a point where the mine field in the center of the playfield is clearly visible.

Circuit Board

On Circuit Board I, (which is on the left side of the cabinet, looking from the rear of the same) there are three (3) adjustments you may want to make.

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 they are set at the same point the volume between the two tanks will be even.

Missile Firing & Explosion Sound: These adjustments are located in the upper left area of the board. Again there are two (2) pots to adjust. Setting the tabs evenly on the pots will set the volume evenly between the two tanks.

Game Time: There is one (1) switch located on Board I and next to this switch is the pot which adjusts the game time. This pot has been preset at the factory so that with the switch in the 25¢ position, one game is available for a quarter and will last for 60 seconds. With the switch in the 50¢ position, one game is available for two (2) quarters and will last for 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.

II. DIAGNOSIS

SYMPTOM

CHECK

No Picture	Fuse, Power Cord, Harness Connections
No Sound	Speaker Connections, Volume Adjustments
Rolling or Tearing Picture	Re-Adjust TV Controls
Game Will Not Start	Coin Mechanism, Harness Connections
No Tank Movement	*Joystick Switches (proper alignment), Harness Connections
No Firing of Shell	*Joystick Switches, Harness Connections

*These are simple on/off switches and may be checked with an ohmmeter or continuity tester.

NORMAL GAME OPERATION

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

To move Tank forward, push both joysticks forward. To stop Tank, pull both joysticks back. For turning to the right, pull right joystick back and push left joystick forward.

To turn left, push right joystick forward and pull left joystick back. Silkscreened into the front panel are illustrated instructions for the different motions.

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

TV TROUBLESHOOTING

NO POWER: Check for blown fuses and proper line voltage. Also check to see if the interlock switch is in the on position, either with the rear door closed or with the switch defeated.

NO PICTURE: Check the monitor fuses. If blown, visually check the monitor for shorts. If fuses are OK, look to see if the CRT's choke filament is glowing and if there are any loose wires.

WHITE PICTURE BUT NO DISPLAY: This symptom indicates two problems. Either the PC Board or the TV is malfunctioning. To double check and make certain of the area of trouble, check the PC Boards that making sure power is reaching them and check the edge connectors making sure they are positioned correctly on the PC Boards. Also check the twelve (12) pin Molex connector on the TV making sure it is correctly connected.

WAVY PICTURE: If this condition exists, check the following two items to be sure they are functioning properly. First check the five (5) volt power supply on the two main circuit boards. This can be done by measuring between the two heavy traces on each board with a voltmeter or an oscilloscope. There should be $5 \pm 1/4$ volts on each board. Next, locate pin 32 on the large monitor circuit board. Measure the voltage from this pin to ground. There should be seventy-three (73) volts at this point. If the voltage is either too high or too low, adjust the 73 volt regulator pot located on the same PC Board in the upper left hand corner. DO NOT TURN THIS POT THRU THE WHOLE RANGE.

Damage will occur to it's associated parts. All that needs to be done is a slight turn to adjust properly.

IMPROPER DISPLAY: Recheck all picture adjustments (brightness, contrast, and etc.) to make sure they are correct.

REMOVAL & REPLACEMENT PROCEDURES

CONTROL PANEL: To achieve easy access to the joystick controls, open the front coin door and remove the two wing nuts mounting the control panel to the cabinet. There is one wing nut on each side. Slide the control panel out far enough to clear the mounting bolts from the cabinet and turn the panel upside down. Set the face of the panel down on the supporting blocks. The joystick controls are now exposed for servicing.

PLEXIGLASS REMOVAL: To remove the plexiglass, open the front coin door and remove the three wing nuts running along the upper frame member of the control panel. Pull the lower aluminum plexiglass anchoring bracket away from the game. The plexiglass should be pushed down and pulled out to remove it from the game.

TV MONITOR REMOVAL: To remove monitor for replacement or repair, first remove plexiglass by following the above plexiglass removal instructions. Also, remove the four screws mounting the plastic bezel. Loosen the two wing nuts by the corners of the CRT by way of the back door. Remove the 10 Pin Molex connector from the back side of the TV. By inserting a finger into the two holes on each side of the CRT, the monitor can be pulled out.

TV MONITOR REPLACEMENT: To replace the TV monitor, follow in reverse order the steps for monitor removal.

MOTOROLA MONITOR PC BOARD REMOVAL

POWER, AUDIO PC BOARD: To remove this PC Board, simply locate it on the left side of the monitor in back of the power transformer. Carefully pull up on the board. To replace this board, locate the slot between Pins 3 & 4 and put this on your left side, then simply insert into the edge connector.

MONITOR PC BOARD: To remove the monitor PC Board, take a screwdriver or a similiar object and slowly pry the PC Board up off of the chassis until it clears the pins. Next, unplug the socket from the yoke and slide board out. To replace this board, follow the above steps in reverse order.

MAIN CIRCUIT BOARDS I & II

REMOVAL: Each board is mounted to the cabinet by two screws located one on each side. Remove the edge connectors first, then remove the four screws. DO NOT TRY TO SEPERATE THE TWO BOARDS. Each set of boards must remain as one unit. After removing boards, carefully follow board shipping procedure in order to reduce the chances of damage to a minimum.

REPLACEMENT: Follow the reverse steps of the removal procedures to replace the PC Boards.

PC BOARD SHIPPING PROCEDURES

When packaging PC Boards for shipment, make sure the top of each board is facing each other with either bubble wrap or foam rubber 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 styrofoam as packing material between the boards. Careful packing is recommended as KEE GAMES, INC. cannot be liable for boards damaged in transit. Also, include a short statement describing the basic problem with the boards.

CABINET MAINTINANCE

Cleaning of the cabinet and plexiglass may be done with any non-abrasive household cleaner. The coin acceptors and lock cylinders should be lubricated periodically with any light oil or silicon aresol spray.

ACCESS DOORS

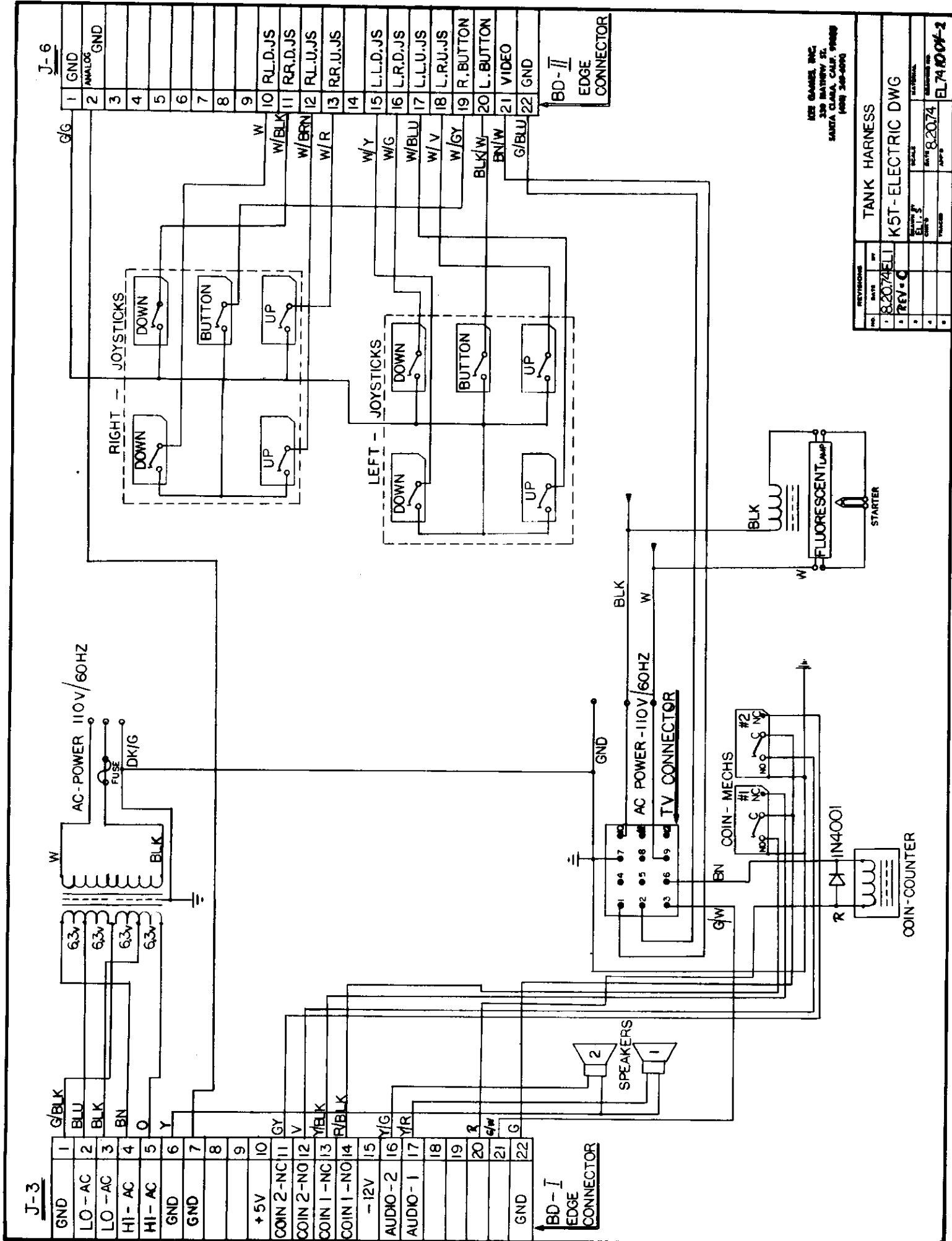
COIN DOOR: There are two coin mechs in each game. The extra coin mech is there for customer convenience and also as a spare in case of a coin jam in one of the mechs. The coin door provides access to the coin box and to all wing nuts used to secure the monitor, control panel and the bracket for the plexiglass CRT screen.

REAR DOOR: The rear door allows access to the Tank PC Board set, the fuse line filter and transformer assy, Motorola monitor controls and PC Board, and the wing nuts securing the control panel, plexiglass and TV monitor.

III. WARRANTY

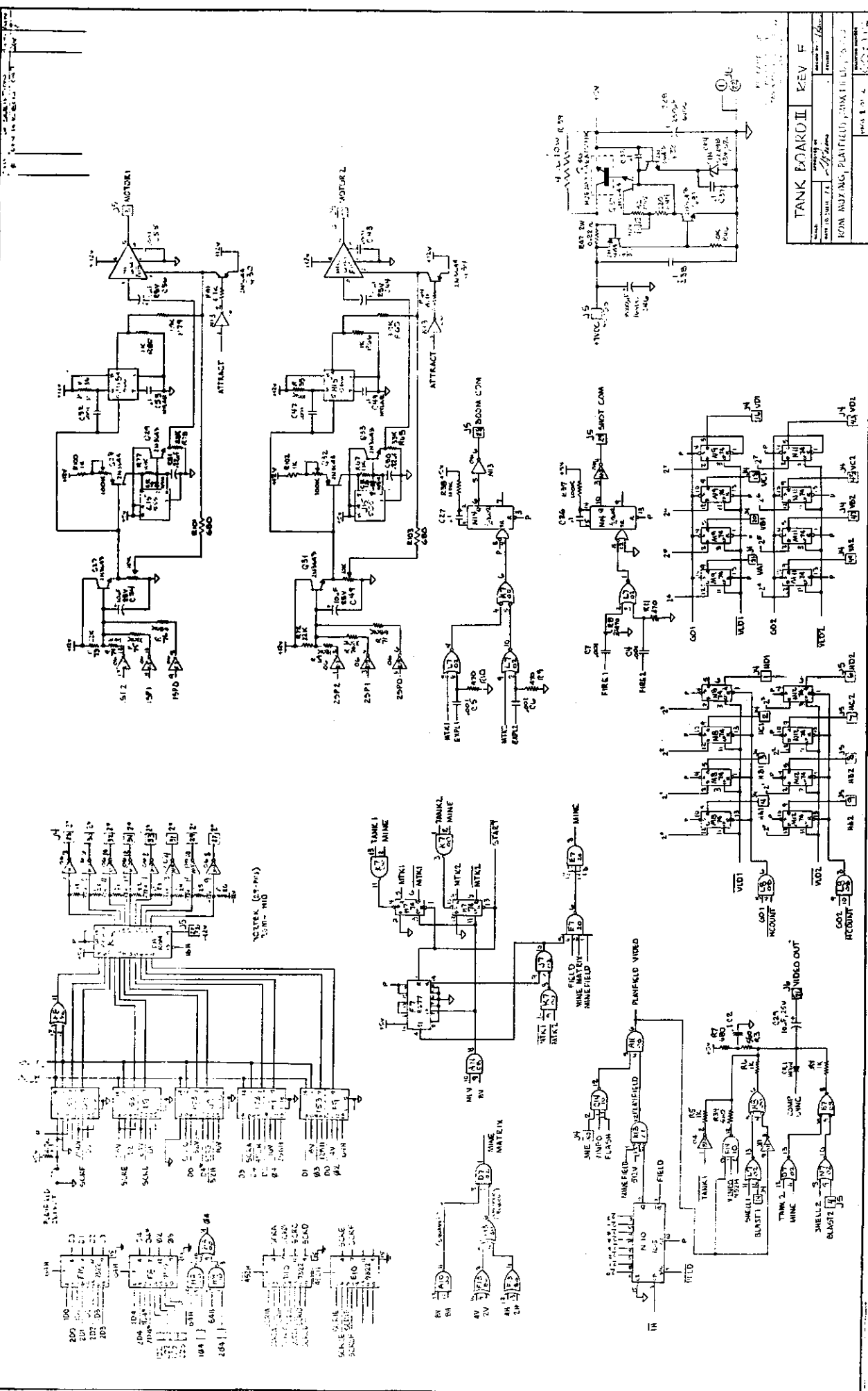
The game is warranted for a period of ninety (90) days, excluding the TV, which is warranted for 30 days.

In case of failure, contact your distributor or KEE GAMES, 1280 Reamwood Ave., Sunnyvale, CA 94086 for repair or a replacement unit.



KES GAMING, INC.
330 BATTERY ST.
SANTA CLARA, CALIF. 95050
(408) 348-0000

REVISIONS				TANK HARNESS			
NO.	DATE	BY	CHK				
1	8.20.74	ELI					
2	REV. C						
				K5T-ELECTRIC DWG			
3				REVISION NO.	DATE	BY	CHK
4				1	8.20.74	ELI	
5				2			
6				3			
7				4			
8				5			
9				6			
10				7			
11				8			
12				9			
13				10			
14				11			
15				12			
16				13			
17				14			
18				15			
19				16			
20				17			
21				18			
22				19			
23				20			
24				21			
25				22			
26				23			
27				24			
28				25			
29				26			
30				27			
31				28			
32				29			
33				30			
34				31			
35				32			
36				33			
37				34			
38				35			
39				36			
40				37			
41				38			
42				39			
43				40			
44				41			
45				42			
46				43			
47				44			
48				45			
49				46			
50				47			
51				48			
52				49			
53				50			
54				51			
55				52			
56				53			
57				54			
58				55			
59				56			
60				57			
61				58			
62				59			
63				60			
64				61			
65				62			
66				63			
67				64			
68				65			
69				66			
70				67			
71				68			
72				69			
73				70			
74				71			
75				72			
76				73			
77				74			
78				75			
79				76			
80				77			
81				78			
82				79			
83				80			
84				81			
85				82			
86				83			
87				84			
88				85			
89				86			
90				87			
91				88			
92				89			
93				90			
94				91			
95				92			
96				93			
97				94			
98				95			
99				96			
100				97			
101				98			
102				99			
103				100			
104				101			
105				102			
106				103			
107				104			
108				105			
109				106			
110				107			
111				108			
112				109			
113				110			
114				111			
115				112			
116				113			
117				114			
118				115			
119				116			
120				117			
121				118			
122				119			
123				120			
124				121			
125				122			
126				123			
127				124			
128				125			
129				126			
130				127			
131				128			
132				129			
133				130			
134				131			
135				132			
136				133			
137				134			
138				135			
139				136			
140				137			
141				138			
142				139			
143				140			
144				141			
145				142			
146				143			
147				144			
148				145			
149				146			
150				147			
151				148			
152				149			
153				150			
154				151			
155				152			
156				153			
157				154			
158				155			
159				156			
160				157			
161				158			
162				159			
163				160			
164				161			
165				162			
166				163			
167				164			
168				165			
169				166			
170				167			
171				168			
172				169			
173				170			
174				171			
175				172			
176				173			
177				174			
178				175			
179				176			
180				177			
181				178			
182				179			
183				180			
184				181			
185				182			
186				183			
187				184			
188				185			
189				186			
190				187			
191				188			
192				189			
193				190			
194				191			
195				192			
196				193			
197				194			
198				195			
199				196			
200				197			
201				198			
202				199			
203				200			
204				201			
205				202			
206				203			
207				204			
208				205			
209				206			
210				207			
211				208			
212				209			
213				210			
214				211			
215				212			
216				213			
217				214			
218				215			
219				216			
220				217			
221				218			
222				219			
223				220			
224				221			
225				222			
226				223			
227				224			
228				225			
229				226			
230				227			
231				228			
232				229			
233				230			
234				231			
235				232			
236				233			
237				234			
238				235			
239				236			
240				237			
241				238			
242				239			
243				240			
244				241			
245				242			
246				243			
247				244			
248				245			
249				246			
250				247			
251				248			
252				249			
253				250			
254				251			
255				252			
256				253			
257				254			
258				255			
259				256			
260				257			
261				258			
262				259			
263				260			
264				261			
265				262			
266				263			
267				264			
268				265			
269				266			
270				267			
271				268			
272				269			
273				270			
274				271			
275				272			
276				273			
277				274			
278				275			
279				276			
280				277			
281				278			
282				279			
283				280			
284				281			
285							

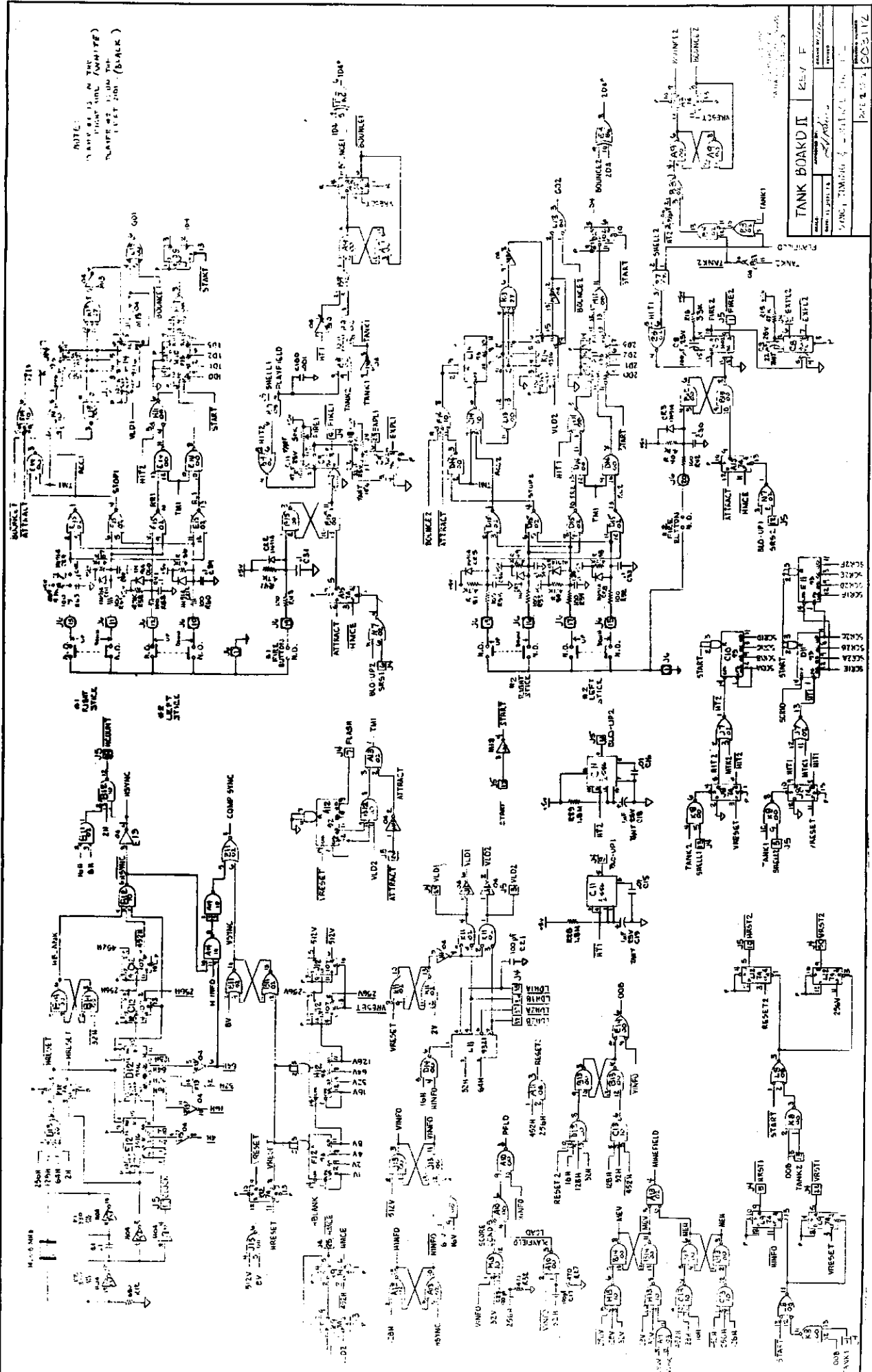


TANK BAKO II REV F

HOW BUYING, PLATED, PLATED, PLATED, PLATED

REV F

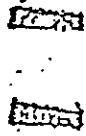
NOTE:
 1. 100V 100W (WHITE)
 2. 100V 100W (BLACK)



TANK BOARD II		REV. F
DATE	11/11/72	DESIGNED BY
TANK 1, TANK 2, SHOOT, SCORE		TESTED BY
REV. 1		205112

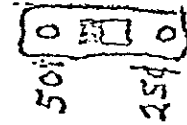
14NN Customer Adjustments

Motor Volumes



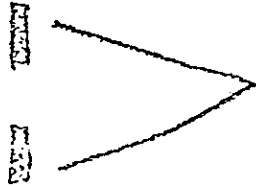
Game time

ADJUST



Coin option switch

Explosion Volumes



Factory Adjustments only

Do not touch

Firing range for
white tank

ADJUST

Range for black tank set

