

Keeney's

VENUS

OPERATION AND SERVICE MANUAL

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2600 WEST 50th STREET

CHICAGO 32, ILLINOIS

VENUS

F-4112-ND

IMPORTANT

The Manufacturer has reserved the right to make changes in design or add any improvements on any games without incurring any obligation to install same on games previously purchased. Dealer reserves a similar right.

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GENERAL DESCRIPTION

Venus is a single coin per card, single player bingo type game. It includes the normal in-line scoring plus corners scoring as well as the new exclusive double or nothing feature.

SPECIFICATIONS

HEIGHT	69" O.A. WITH LEGS
WIDTH	24 $\frac{1}{2}$ " O.A.
DEPTH	56 $\frac{1}{4}$ "
WEIGHT	259 LBS.
SHIPPING WEIGHT	294 LBS
OPERATING VOLTAGE	105V-125V 60CY A.C.
OPERATING CURRENT (MAX.)	3.3 AMPS
OPERATING CURRENT (IDLE)	.5 AMPS
COIN CHUTE	COIN ACCEPTORS 5-10-25¢(OPTIONAL)

SECTION I INSTALLATION

1.1 ASSEMBLY AND SET UP

After removing game from crate, assemble and set-up as follows:-

1. Install legs and leg adjusters on both back cabinet and front cabinet before combining the two units.
2. Lean cabinet back against wall and then slide front cabinet into cavity and join units with four side bolts and two back bolts.
3. Use leg levelers to guarantee proper slug rejector and playfield operation.
4. Be sure all plugs and sockets are properly mated and securely anchored for good contact.

Check the game thoroughly for properly lit bulbs and general operation. A card is provided for the customer's use to list all the comments and criticisms on the game as delivered. This is an aid to assure high standards of production, inspection and future improvements.

1.2 PLAY INSTRUCTIONS

To start game insert coin, or press replay button if replays are present on the score unit. Additional coins or replays may be used to activate card numbers two through six. The first coin or replay opens the playfield shutter and cycles the game to a reset position with the first card only in play. When the desired number of cards have been purchased the balls may be lifted to the shoot position and shot.

SECTION I
INSTALLATION

1.2 PLAY INSTRUCTIONS (CONTINUED)

The first ball shot opens the ball gate switch which allows the playfield to close. As the balls are shot, lodging in pockets on the playfield, the in-line or four corners combinations are built. When the fourth ball is elevated to the shoot position the player becomes eligible to select two types of scoring.

A green section will light reading "Press Green Button to Play Regular". A red section will also light reading "Press Red Button to Play Feature". The player may select now or wait until all five balls have been played. If he selects the green button only the section stating "Play Regular" will remain lit. The start search push button will now allow the search to take place and all scoring will be according to the instruction card. If he selects the red button both red and green sections go out and sections noted "Double" and "Nothing" will alternately light. When the flash stops and "Nothing" remains lighted all scoring is forfeited and the start search button is inactive. If "Double" remains lighted then the start search button will start a search cycle and all scoring will be twice that of the instruction card.

SECTION II OPERATION

2.1 VOLTAGES

All step up coils, shutter motor, and relays (except the search relays) operate on 50 volts A.C.

The control unit motor operates on 110 volts A.C.

The display lights, card selected lights and tilt light are operated on 6 volt A.C.

The search relays are operated on 17 volts A.C.

The pocket number lites on backglass are 6 volts each and are wired three in series, operating on 17 volts A.C.

2.2 COIN MECHANISM

The coin mechanism in this game is of the single coin type. It will only accept coins as indicated. A lockout coil is incorporated in the assembly to make the mechanism reject coins during start or win cycle, or in event current is shut off. To assure trouble-free operation of this unit, it should be cleaned periodically since coins handled by moist hands will sometimes leave a residue which tends to build up in the mechanism.

2.3 COIN RELAY

This relay is energized by the coin switch. It is operable only when no replays are present. Normally open contacts energize the card relay until the cut-off relay energizes. Meter impulses are supplied by another set of normally open contacts.

SECTION II OPERATION

2.4 START RELAY

This relay is energized by the card relay on the initial coin only. Normally open contacts of this relay energize the control unit motor and the shutter motor. The control unit motor then returns the feature control unit to zero through action of normally open contacts of this relay. The shutter motor cam switch opens at 180°, with playfield open, and releases the lock to this relay.

2.5 CARD RELAY

This relay operates with each play whether coin or replay. It remains energized through its own contacts until the cut-off relay energizes. It provides an impulse for each game played for metering. Each actuation pulses the score unit reset coil to subtract credits as games are played. The initial impulse resets the card step-up unit and energizes the start relay. Subsequent impulses steps up the card unit to the desired selection.

2.6 CUT-OFF RELAY

This relay operates with the card unit end of stroke make switch. This prevents locking the card unit step-up coil in an energized condition.

SECTION II OPERATION

2.7 INITIAL COIN RELAY

This relay energizes when the card unit resets to the zero position. This energization transfers circuitry so subsequent plays advances the card unit to desired selection. The start relay circuit is also opened. Upon shooting the first ball this relay is released setting conditions for a start cycle on next play. Accidental tilting of the game before shooting the first ball also releases this relay.

2.8 GAME RELAY

This relay is energized when the score unit is in the zero position. It is locked through its own contacts and will remain so until power is interrupted. When energized it completes the circuit to the coin switch or replay button. When de-energized it energizes the score reset relay.

2.9 SCORE RESET RELAY

This relay is energized at any time the game relay is de-energized. When energized it completes the circuit to the control unit motor. This relay then feeds the impulses from the control unit cam (16) to the score unit reset and to the meter adjustment socket. This relay when energized also trips the tilt relay setting up conditions so that the next coins when played is recognized as the initial coin.

SECTION II OPERATION

2.10 SEARCH RUN RELAY

This relay is energized by the start search push button. This can be done only when the player has selected either play regular or play feature. In case of selecting play feature then the search run can only be energized if double has remained lighted. While energized this relay completes the circuit to the control unit motor. This allows it to release search wiper 1-2-3, when wiper 4-5-6 is at zero, and cycle it. When wiper 1-2-3 completes its search and nears its lock position it releases wiper 4-5-6. When wiper 4-5-6 completes its search and nears its lock position it opens a pin switch releasing the search run relay and stopping the search. Repeated searches may be started by the player with subsequent actuation of the start search button.

2.11 TILT LATCH RELAY

This relay is tripped by the score reset relay or any of the various tilt switches. This tripping is done through normally closed contacts of the relay so that a jammed switch will not overheat the coil due to a prolonged energization. When tripped it releases the initial coin relay, if it is still energized, setting up conditions for the next play to be recognized as the initial coin. It opens the circuitry to the search matrix and prevents the scan index from recognizing any in-line combinations.

SECTION II OPERATION

2.11 TILT LATCH RELAY (CONTINUED)

This relay when tripped opens the circuit to the card number lights and lights tilt on the backglass. All select push buttons, play regular, play feature, and start search are imoperative when this relay trips. This relay is reset on the next start cycle by the same impulse that resets all the commutators.

2.12 WIN RELAY

This relay energizes when the impulse cams position properly for score unit and commutator advance. This condition happens only after one of the scan indexes are energized. It provides paths for "score" meter advance, score unit advance, and commutator advance.

2.13 SEARCH RELAYS

These relays energize from the search in respect to the playfield pockets containing balls. Each card has a total of twelve possible five in-line and one four corners combination. Each of these combinations have a line on the search disc. When all five search relays are energized at the same time it is because of a five in-line combination being present. When search relays one, two, four and five as well as both corners relays are energized it is because of a four corners combination being present. Any consecutive three relays, (1-2-3, 2-3-4, or 4-5-6), signifies the presence of a three-in-line combination etc. See later pages for charts giving exact disc sequences.

SECTION II OPERATION

2.14 SCAN INDEXES

These relay type coils energize whenever an uncompensated combination is sensed. The circuitry involved is through the search disc to the commutator disc, to see if the replays have been registered. From the commutator disc to the card disc, to see if the proper number of plays have been made. From the card disc to the search disc and then to the index coil. Drive make switches on the commutator step ups insure that the circuitry is not broken as the commutator steps from rivet to rivet. Each scan index also energizes the impulse release so that replays may be registered. Each index as it operates opens a set of contacts which bypass a fifteen ohm, five watt resistor in series with the coil. After a fast energization the coil is now held with a lower voltage so as to eliminate overheating on long pay outs.

2.15 IMPULSE INDEX

This solenoid operated latch is energized when an in-line combination is found. This actuates a switch completing the circuit to the control unit motor and lets the impulse cams cycle through a guaranteed ninety degrees. When the offset cam (2 lobes) actuates its associated switch it energizes the win relay. This insures that the proper ratio will be maintained between the commutators and the score

SECTION II OPERATION

2.15 IMPULSE INDEX (CONTINUED)

unit. The sixteen lobe cam supplies the impulses to the score unit and meter adjustment socket. The remaining two cams of four lobes and two lobes provide impulses to the commutator step ups, the former for regular, the latter for double. A cam sequence chart on a following page will give a complete picture of cam action.

2.16 SELECT RELAY

This relay energizes when the fourth ball is elevated to the shoot position leaving only one ball in the ball trough. It allows the players to select, either now or later, one of two modes of scoring. The backglass at this time lights up to signal use of buttons in selecting. This relay will remain energized until a new start cycle begins.

2.17 PLAY REGULAR RELAY

This relay is energized by the play regular push button. This can only be done after the select relay has been energized and, the play feature relay has not been energized. This relay action completes the circuit to the start search push button. The backglass lights will then show only play regular. This relay will remain energized until the card relay energizes at the start of the next game.

SECTION II OPERATION

2.18 PLAY FEATURE RELAY

This relay is energized by the play feature push button. This can only be done after the select relay has been energized and, the play regular relay has not been energized. This action releases the feature control cams. The backglass will then show only "double" or "nothing" as controlled by the feature flash cam. It also completes the circuit to the control unit motor allowing the released cams to cycle. This relay will remain energized until the card relay energizes at the start of the next game.

2.19 FEATURE CONTROL RELEASE

This solenoid operated latch energizes when the play feature relay is energized. Through the action of the variator cam switch it can stop, for varying lengths of time, at 90, 180, and 270 degrees. This action varies the length of flash on the feature flash cam. When the feature control cam reaches 315 degrees the action stops and remains at this point until the next start cycle. The start relay will then energize the feature control release and allow it to return cams to zero degrees. From 9 degrees to 315 degrees the feature control cam energizes the feature flash release.

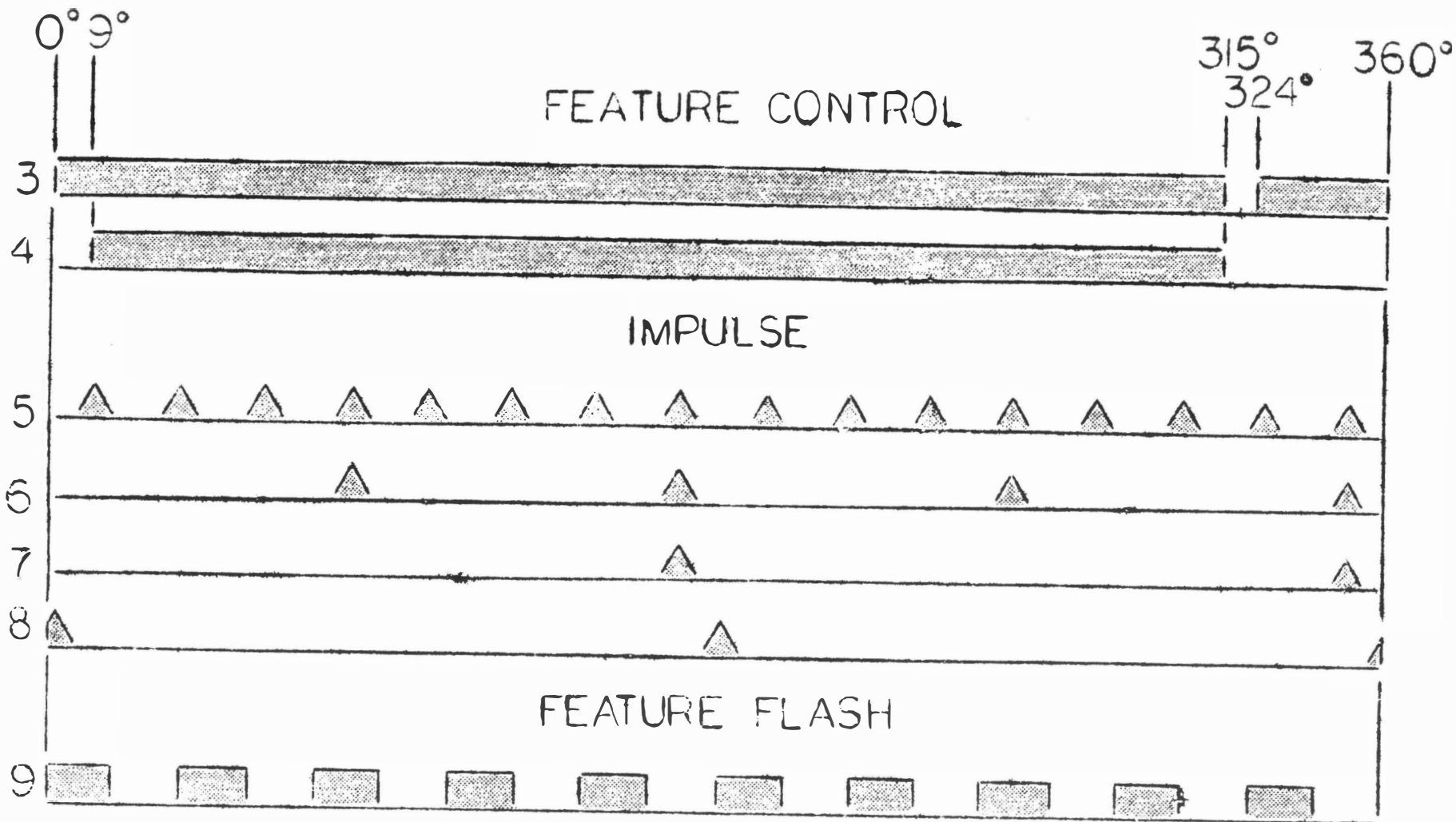
SECTION II OPERATION

2.20 FEATURE FLASH CAM RELEASE

This solenoid operated latch will energize and release the feature flash cam during the feature control cycle. It allows the feature flash cam to alternate the "double" or "nothing" lights. When it stops in the nothing position it opens the circuit to the start search push button. When it stops in the "double" light position the commutator advance circuit is transferred from the four lobe to the two lobe cam of the impulse cams section. The latch arm actuates two switches. It closes one completing the circuit to the control unit motor insuring that the flash cam returns to a latch position at the end of a cycle. It opens the other which is the circuit to the start search push button.

2.21 WIPER LOCKS 1-2-3 AND 4-5-6

Wiper lock 1-2-3 energizes when the search run relay is energized and search wiper 4-5-6 is locked. Wiper lock 4-5-6 energizes as search wiper 1-2-3 completes its search and nears its lock position. This gives an alternate scan on the two search discs and allows use of one set of search relays only.



CAM SEQUENCE CHART

SELECTIONS 1-2-3

SEARCH POSITIONS CHART

		WIPER 1 SEARCH RLY 1	WIPER 2 SEARCH RLY 2	WIPER 3 SEARCH RLY 3	WIPER 4 SEARCH RLY 4	WIPER 5 SEARCH RLY 5	
		1					
		2					
		3					
		4					
HOR		5	5	1	9	25	3
		6	8	22	10	19	7
		7	6	18	16	11	17
		8	24	21	14	20	13
VER		9	12	23	2	4	15
		10	5	8	6	24	12
		11	1	22	18	21	23
		12	9	10	16	14	2
DIAG CORNERS		13	25	19	11	20	4
		14	3	7	17	13	15
		15	5	22	16	20	15
		16	12	21	16	19	3
		17	5	3		12	15
		18					
HOR		19	9	24	16	4	6
		20	13	19	14	20	25
		21	2	18	15	12	17
		22	1	22	11	21	8
VER		23	10	7	5	23	3
		24	9	13	2	1	10
		25	24	19	18	22	7
		26	16	14	15	11	5
DIAG CORNERS		27	4	20	12	21	23
		28	6	25	17	8	3
		29	9	19	15	21	3
		30	10	22	15	20	6
		31	9	6		10	3
		32					
HOR		33	3	7	10	4	9
		34	24	21	18	22	8
		35	15	14	17	11	2
		36	13	20	12	19	23
VER		37	6	25	16	1	5
		38	3	24	15	13	6
		39	7	21	14	20	25
		40	10	18	17	12	16
DIAG CORNERS		41	4	22	11	19	1
		42	9	8	2	23	5
		43	3	21	17	19	5
		44	6	20	17	22	9
		45	3	9		6	5
		46					
		47					
		48					
		49					
		50					

SEARCH POSITIONS CHART

		WIPER 1 SEARCH RLY 1	WIPER 2 SEARCH RLY 2	WIPER 3 SEARCH RLY 3	WIPER 4 SEARCH RLY 4	WIPER 5 SEARCH RLY 5	
	1						
	2						
	3						
	4						
HOR	5	6	7	3	24	1	SEL 4
	6	23	14	12	18	2	
	7	5	19	20	16	22	
	8	11	17	9	15	25	
VER	9	10	13	21	4	3	SEL 4
	10	6	23	5	11	10	
	11	7	14	19	17	13	
	12	3	12	20	9	21	
DIAG CORNERS	13	24	18	16	15	4	SEL 4
	14	1	2	22	25	8	
	15	6	14	20	15	8	
	16	10	17	20	18	1	
HOR	17	6	1		10	8	SEL 5
	18						
	19	8	23	10	13	4	
	20	2	17	16	14	24	
VER	21	20	12	22	19	5	SEL 5
	22	25	15	9	18	11	
	23	1	7	21	3	6	
	24	8	2	20	25	1	
DIAG CORNERS	25	23	17	12	15	7	SEL 5
	26	10	16	22	9	21	
	27	13	14	19	18	3	
	28	4	24	5	11	6	
HOR	29	8	17	22	18	6	SEL 6
	30	1	15	22	14	4	
	31	8	4		1	6	
	32						
VER	33	4	6	1	23	5	SEL 6
	34	25	15	3	17	13	
	35	9	19	21	12	20	
	36	10	18	16	14	8	
DIAG CORNERS	37	7	24	22	2	11	SEL 6
	38	4	25	9	10	7	
	39	6	15	19	18	24	
	40	1	3	21	16	22	
HOR	41	23	17	12	14	2	SEL 6
	42	5	13	20	8	11	
	43	4	15	21	14	11	
	44	7	18	21	17	5	
VER	45	4	5		7	11	SEL 6
	46						
	47						
	48						
DIAG CORNERS	49						SEL 6
	50						

SECTION III MAINTENANCE

3.1 MAINTENANCE AND LUBRICATION INSTRUCTIONS

Like any other piece of equipment, this machine requires maintenance and periodic lubrication. By following the instructions listed below, operating troubles will be greatly minimized.

1. A periodic check of the entire machine for any parts which may require slight adjustments.
2. A periodic check of female sockets by crimping slightly with fingers to insure a positive contact with male portion of same socket.
3. All relay and switch stacks may occasionally require tightening.
4. After tightening relay and switch stacks, all relay and switch contacts should be reinspected for proper contact and gap.

A minimum of 1/32 inch follow thru is required for proper relay and switch contact operation. If necessary to clean relay and switch contacts, a burnishing tool or crocus cloth may be used. Under no circumstances use a file of any type to clean contacts.

5. Fuse clips may occasionally be tightened to insure proper fuse contact.

SECTION III MAINTENANCE

Note:-

Clutch spring tension adjustments should be made after clutch leather washers are lubricated as per instructions under (Lubrication).

3.2 LUBRICATION INSTRUCTIONS

CAUTION: Over lubrication is sometimes more harmful than too little lubrication. All lubricants should be used sparingly for proper operation. Never under any circumstances use a vaseline as a lubricant.

1. All contact discs should be cleaned periodically with a suitable solvent (carbon tetrachloride is considered excellent for this purpose).

After contact discs are cleaned of all residue, a very light film of coin machine grease should be applied to contact disc. A tube is furnished with each game.
2. Shafts and levers of step-up units and all other levers and linkages should be sparingly lubricated, with an oil of the three-in-one type.
3. Ratchets of step-up units should be lubricated slightly with coin machine grease.
4. Leather washers on units utilizing slip clutches should be soaked in neatsfoot oil as a lubricant.
5. All linkages should be lubricated with oil.

SECTION III MAINTENANCE

CAUTION: Never lubricate a plunger or a solenoid. A periodic disassembly of solenoid and plunger, after which both units should be wiped clean is all that is required.

6. Contact wipers on step-up units and all other units utilizing wiper fingers should be occasionally checked for finger tension. The proper amount of tension can be noted if the disc is moved away from the wiper. This wiper should follow the disc for approximately 1/32 inch before the wiper leaves the disc. On slightly warped discs, tension of fingers may be slightly increased. Discs that are extremely warped should be replaced.

NOTE: Too much wiper tension will cause unit to operate very sluggishly and fail to reset properly. Too light tension will cause intermittent failure of some portion of circuit which it operates.

7. Units utilizing a slip clutch should be checked for clutch spring tension occasionally.
 - (a) A clutch spring tension that is too tight will cause a strain on the motor which will eventually become weak and cause failures.
 - (b) A clutch spring that is too loose will not allow fingers to rotate due to extreme slippage and will not function properly.

VENUS
SECTION IV
REPLACEMENT PARTS LIST

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
<u>SOLENOIDS</u>		
SCORE UNIT STEP-UP	10 OHM	1326-B4-48
SCORE UNIT RESET	10 OHM	1326-B4-48
LATCH TILT SET-UP	15 OHM	1326-B4-51
LATCH TILT TRIP	17 OHM	1326-B3-13
CARD STEP-UP	10 OHM	1326-B4-49
CARD RESET	15 OHM	1326-B4-51
COMMUTATOR STEP-UPS	10 OHM	1326-B4-49
COMMUTATOR RESETS	15 OHM	1326-B4-51
CAM RELEASES	15 OHM	1326-B4-2
SCAN INDEXES	15 OHM	1326-B5-4
<u>COIN MECHANISM</u>		
5¢ COIN	} OPTIONAL AS REQUIRED	CU-1010-A
10¢ COIN		CU-1009-A
25¢ COIN		CU-1011-A
<u>MOTORS</u>		
CONTROL UNIT	15 RPM 110V	E-3038-A
SHUTTER	17 RPM 50V	E-3001-A
<u>TRANSFORMER</u>		
POWER	PRI. 115V.	TR-1004
	SEC. #1-50V.	
	SEC. #2-17V.	
	SEC. #3- 6V.	
<u>FUSES</u>		
115V. CIRCUIT	7.5 AMP	118-K-110
50V. CIRCUIT	10 AMP	118-L-106
17V. CIRCUIT	15 AMP	118-K-107
6V. CIRCUIT	7.5 AMP	118-K-110
115V. CIRCUIT	5 AMP	118-K-105

VENUS
SECTION IV
REPLACEMENT PARTS LIST

<u>RELAYS</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>COIL PT. NO.</u>
COIN	E-2402-A	80 OHM	1326-B3-15
CARD	E-2931-A	80 OHM	1326-B3-15
CUTOFF	E-2411-A	80 OHM	1326-B3-15
INITIAL COIN	E-2693-A	100 OHM	1326-B3-16
SCORE RESET	E-2671-A	100 OHM	1326-B3-16
GAME	E-2405-A	100 OHM	1326-B3-16
START	E-3059-A	80 OHM	1326-B3-15
PLAY REGULAR	E-2941-A	100 CHM	1326-B3-16
PLAY FEATURE	E-3036-A	100 OHM	1325-B3-16
WIN	E-2610-A	100 OHM	1326-B3-16
SELECT	E-2810-A	100 OHM	1326-B3-16
SEARCH RUN	E-3053-A	100 OHM	1326-B3-16
SEARCH #1	E-3054-A	ORDER AS COMPLETE UNIT	
SEARCH #2	E-3029-A	" "	" "
SEARCH #3	E-3027-A	" "	" "
SEARCH #4	E-3054-A	" "	" "
SEARCH #5	E-3054-A	" "	" "
CORNERS #1	E-3029-A	" "	" "
CORNERS #2	E-3029-A	" "	" "

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>
<u>LAMPS</u>		
INSERT	#51 BULBS	127-K-406
PLAYFIELD	#47 BULBS	127-K-405