



SPACE FIREBIRD

OPERATION MANUAL



Nintendo

C O N T E N T S

1. SPECIFICATIONS	.....	2
2. INSTALLATION OF THE MACHINE	.....	3
(1) Cautions on installation		
(2) Adjustment of table height		
(3) Earthing of machine		
3. POINTS AND METHODS OF ADJUSTMENT		
(1) CPU P.C.Board	.....	4
(2) Video Monitor and ESS P.C.Board	.....	5
4. WIRING AND CONNECTION	.....	6
5. NAME OF EACH PARTS		
(1) Body	.....	7
(2) Table	.....	8
(3) Control Box	.....	9
6. PARTS LIST	.....	10

C A U T I O N S

1. CPU P.C.Board, Video P.C.Board and ESS P.C.Board should not be exposed direct to the sun. Direct sunshine is very harmful to LSI (memory element).
2. CPU P.C.Board, Video P.C.Board and ESS P.C.Board to be stored or transported should be wrapped by a conductive pouch or aluminum foil, because LSI and IC used in the machine are semiconductor integrated circuits of which basic element is MOS-FET.
3. When images on the Video Monitor screen are disturbed by powerful noise or other electrical causes, turn the main power off once and then on again.

1. SPECIFICATIONS

- (1) Power Supply : 120, 220, 240V \pm 10%
- (2) Power Consumption : 73W
- (3) Size : 860(W) x 560(D) x 580(H) mm.
Height : Adjustable
- (4) Weight : 54 Kgs.
- (5) Coinage : 1 or 2 coins per play, 1 coin for
1 player, 2 coins for 2 players
- (6) Number of Player : 1 or 2 person(s)
- (7) Number of Space Ship : 3 - 6 (Adjustable)
- (8) Accessories : Operation Manual : 1 copy
Key for Table Lock : 2 pcs.
Key for Cash Box : 2 pcs.
Bolt (M8 x 15) : 2 pcs.
Fuse : 3 pcs. 120V..... 4A x 2, 0.3A x 1
220-240V... 4A, 2A, 0.3A

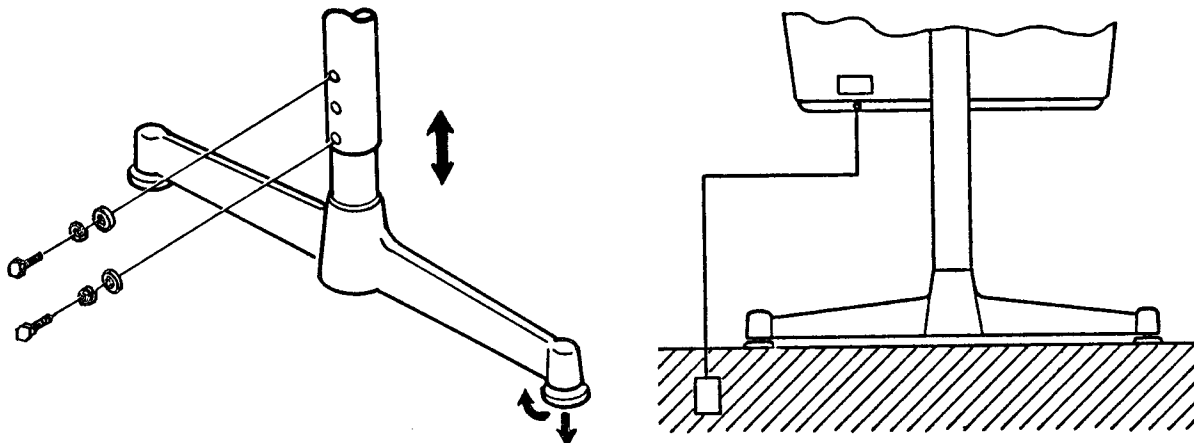
NOTE : Specifications are subject to change for improvement
without notice.

2. INSTALLATION OF THE MACHINE

2-1 Cautions on installation

- (1) The power cord of the machine should not be connected to a wall outlet together with large load unit(s) such as motor, cooler, etc.
- (2) Turn the power off before setting and removing the P.C. Board and connectors. Carefully handle them.
- (3) Do not touch IC, LSI and other electronic parts on P.C. Boards. Do not use a tester or the like on them. (They may be damaged by the inner voltage of the instruments.)
- (4) When exchanging a fuse, use a new one of the prescribed capacity.
- (5) The machine should be installed where it is not hot, keeping away from a heating appliance and direct sunshine.
- (6) The machine should be installed where it is not wet and dusty.
- (7) Do not touch the inside of the video monitor which has high tension units. Inform service station, if necessary.

2-2 Adjustment of table height



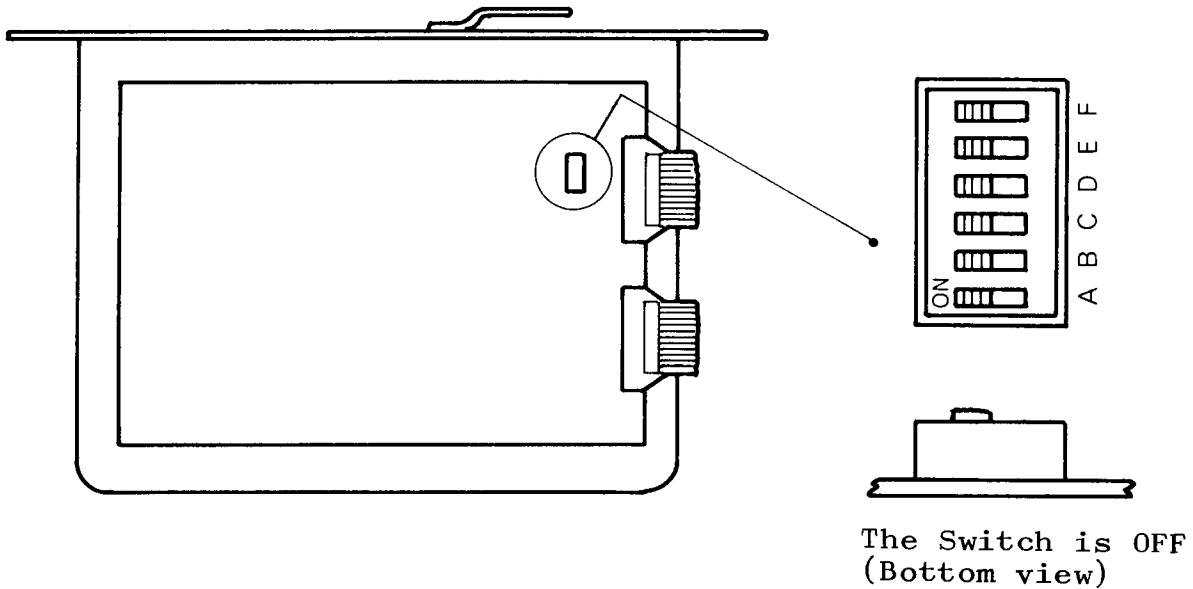
2-3 Earthing of machine

- (1) When the machine is installed in a wet place, it should be grounded to avoid accident by an electric shock.
 - a) Connect an earthing wire to the earthing terminal of the machine.
 - b) The opposite end of the earthing wire should be connected to an earthing bar which is firmly inserted into the ground.
- (2) Cautions
 - a) Do not connect the earthing wire to a water pipe, because polyvinyl-chloride pipes are sometimes used in the water lines and, if so, the electronic continuity is cut at the points.
 - b) Do not connect the earthing wire to the gas pipe absolutely. That is very dangerous.

3. POINTS AND METHODS OF ADJUSTMENT

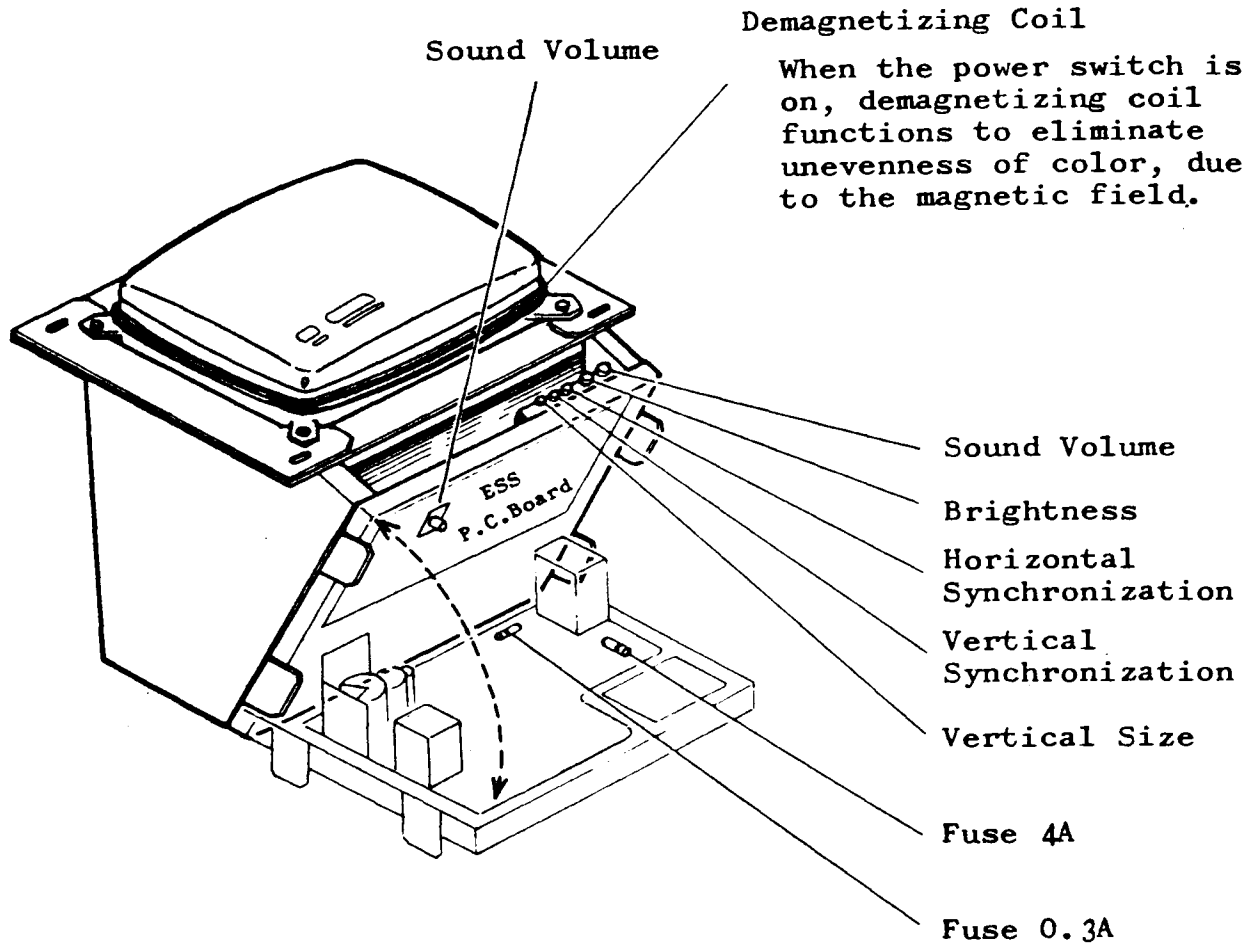
3-1 CPU P.C.Board

The number of space ships, the number of coin and score level can be set with the switches on the CPU P.C.Board according to the diagram below.



	A	B	C	D	E	F
Number of space ship						
3	ON	ON				
4	OFF	ON				
5	ON	OFF				
6	OFF	OFF				
Coinage						
1 coin / 1 play			ON	ON		
2 coins / 1 play			OFF	ON		
1 coin / 2 plays			OFF	OFF		
USA						
3 coins / 1 play			ON	OFF		
Other territories						
1 coin / 3 plays			ON	OFF		
Score level for extra space ship						
5,000 points					ON	
8,000 points					OFF	
Table / Up-Right						
Table						ON
Up-Right						OFF

3-2 Video Monitor and ESS P.C.Board

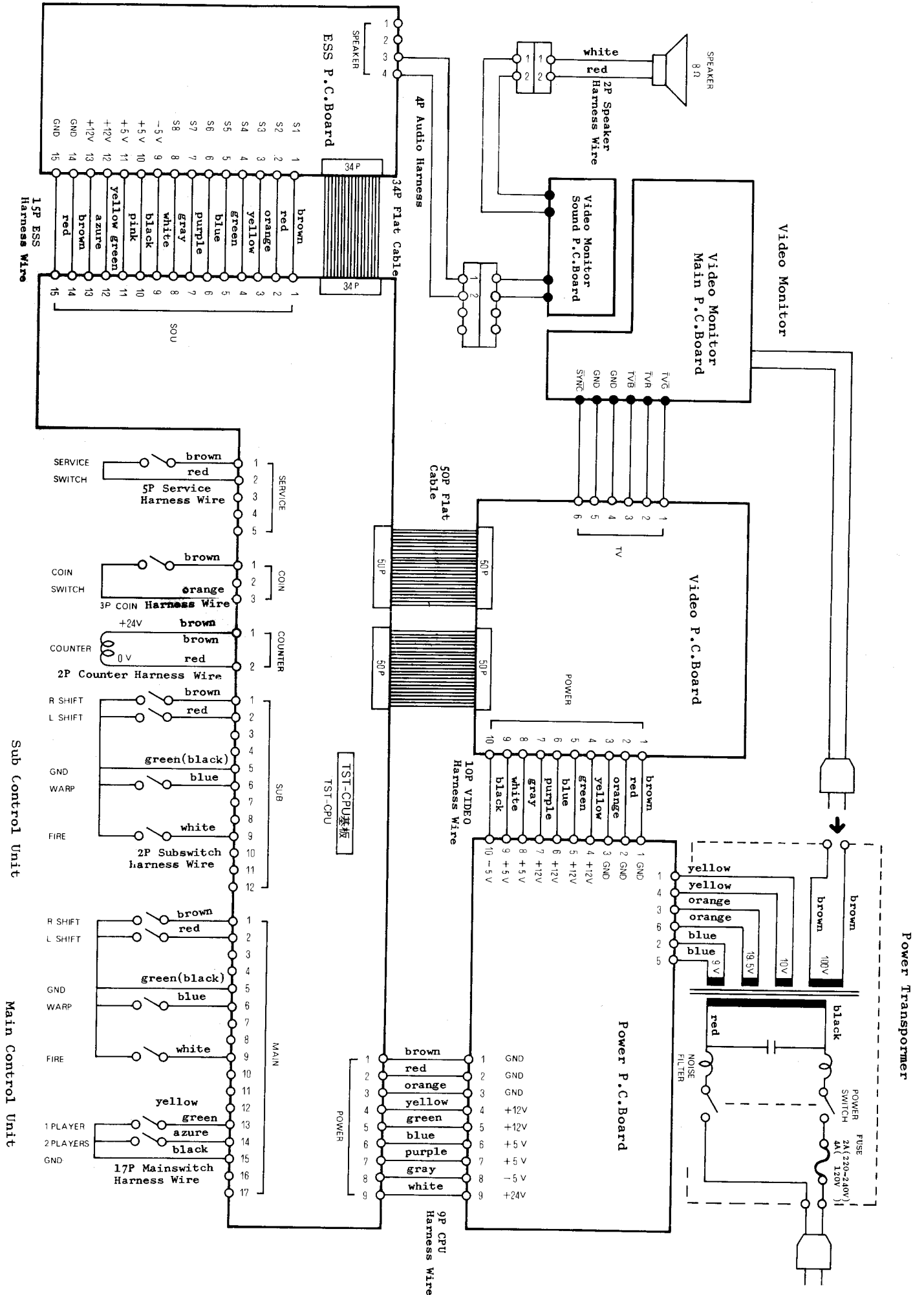


NOTE : Do not touch the inside of the video monitor in which many parts are supplied with high tension.

Sound volume adjustment can be made either on the ESS P.C.Board or on the Video Monitor.

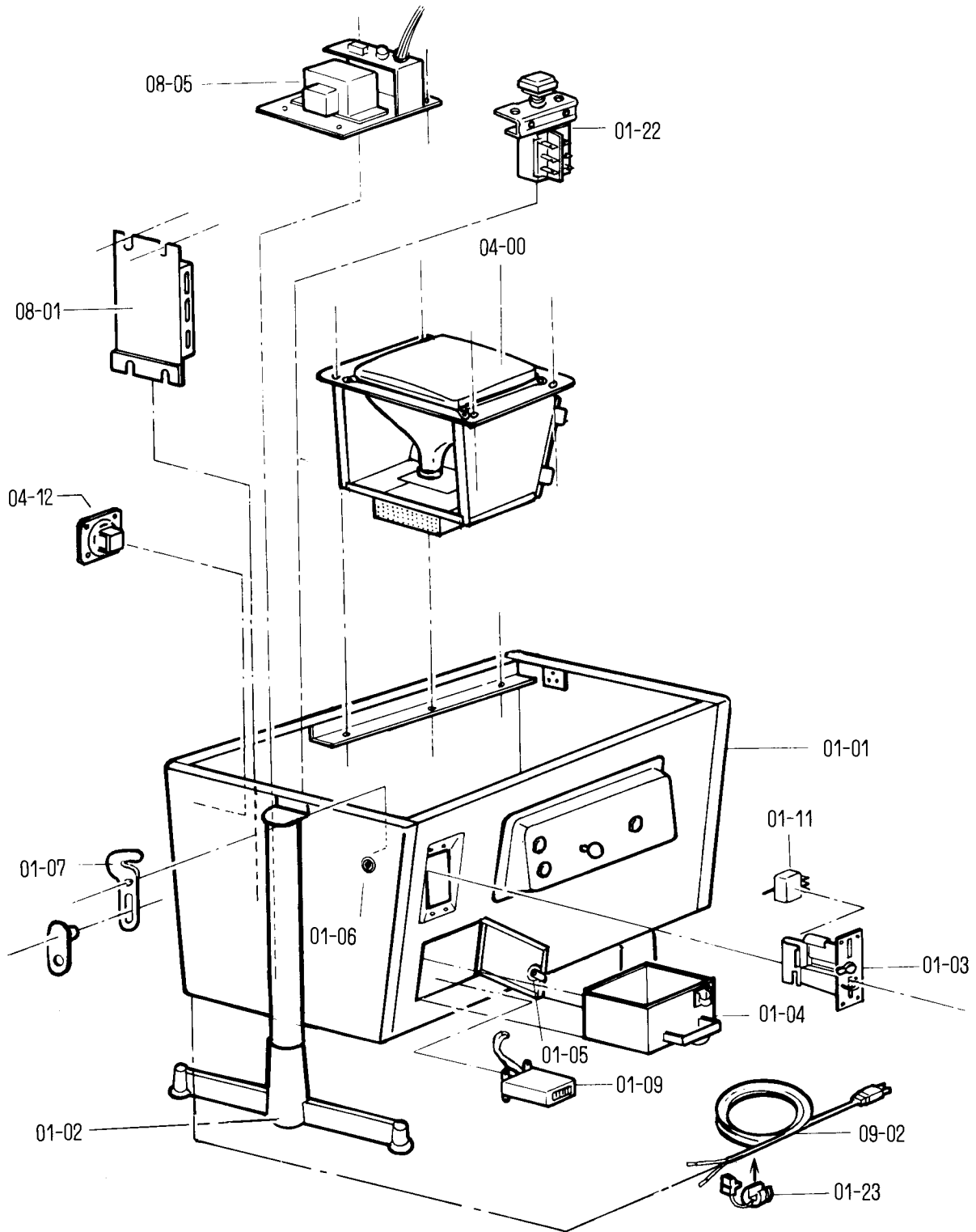
Fix harness wire when opening and closing the table.

4. WIRING AND CONNECTION

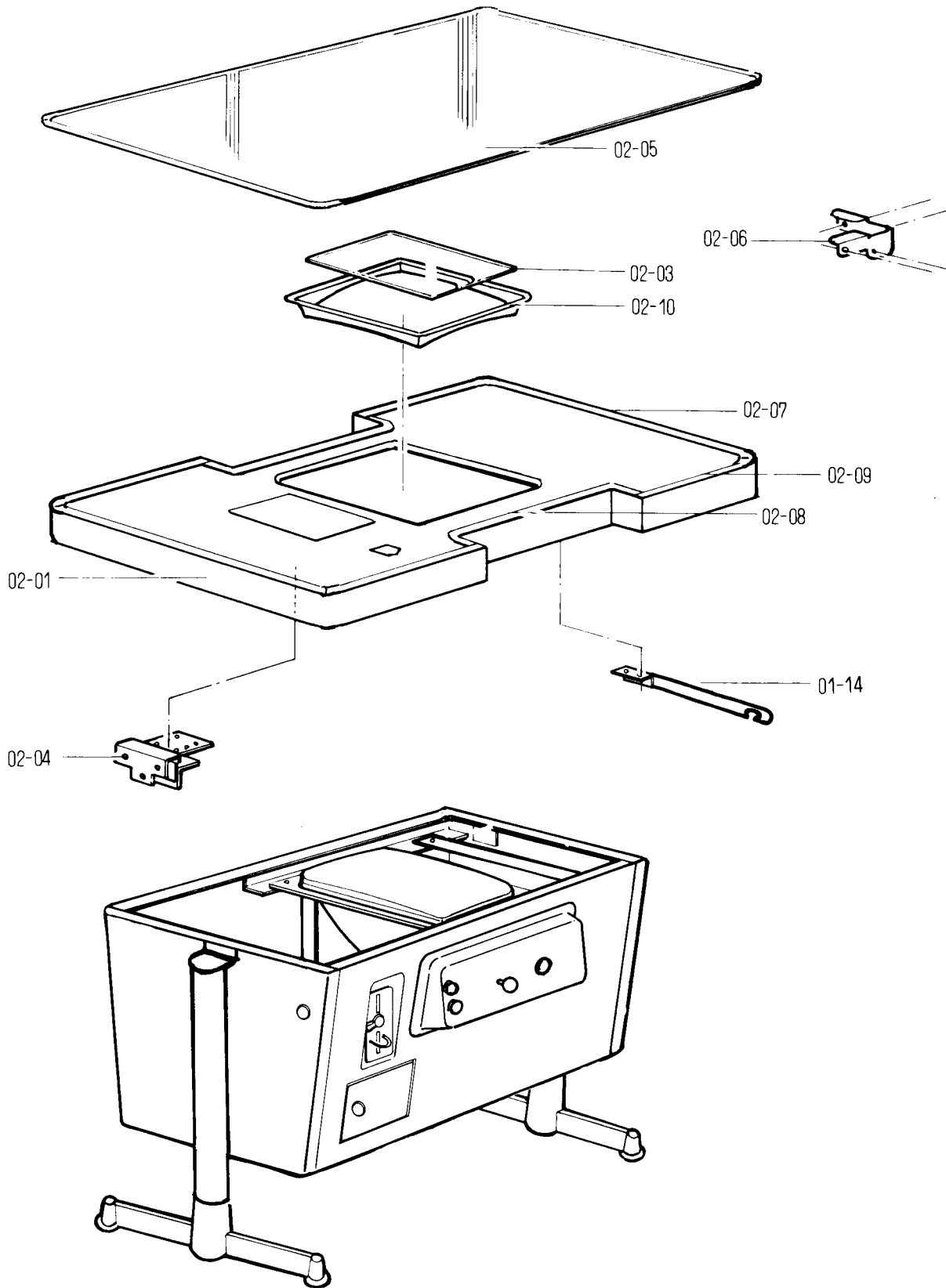


5. NAME OF EACH PARTS

5-1 Body



5-2 Table



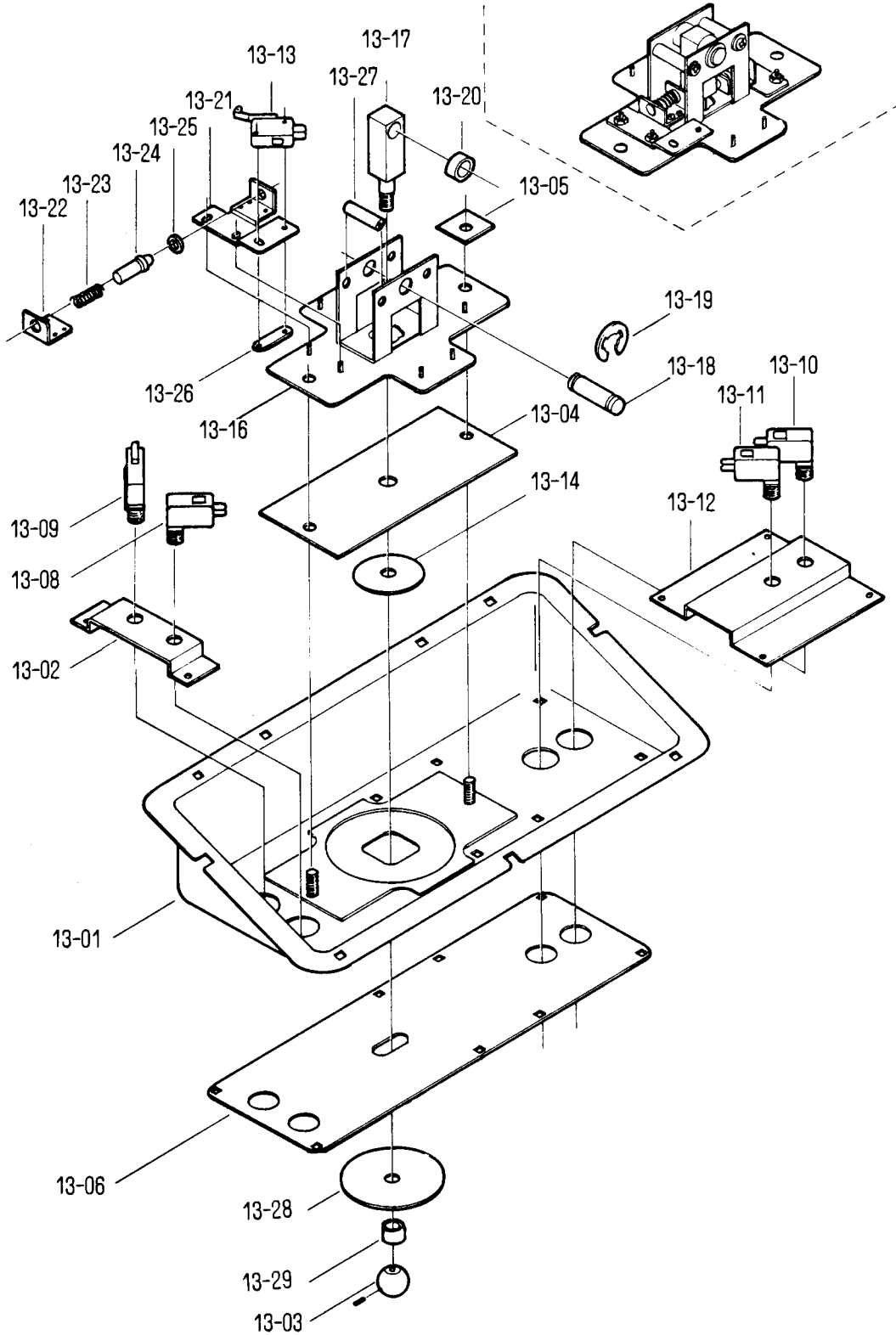
5-3 Control Box

These figures show main side. On the sub side, 13-02, 13-08 and 13-09 are not used and 13-07 is used in place of 13-06.

Following lubricating oil is used.

Shinetsu silicon grease
"SILICOLUBE G31-L"

13-15 Shift Lever Ass'y
(without 13-13)



6. PART LIST

1. Body

No.	Name of Parts	Q'ty	Remarks	FOB Japan per pc.
TST 01-01	Cabinet	1		
TST 01-02	Leg	2		
TST 01-03	Coin Selector	1		
TST 01-04	Cash Box	1		
TST 01-05	Cash Box Door Lock	1		
TST 01-06	Table Lock	2		
TST 01-07	Lock Fitting(Lower)	2		
TST 01-09	Game Counter	1		
TST 01-11	Coin Switch	1		
TST 01-12	CPU P.C.Board Mounting Bracket	1		
TST 01-13	P.C.Board Support	15		
TST 01-14	Table Stay	1		
TST 01-22	Service Switch	1		
TST 01-23	Strain Relief Bushing	1		
TST 02-01	Table	1		
TST 02-03	Video Monitor Filter	1		
TST 02-04	Lock Fitting (Upper)	2		
TST 02-05	Table Glass	1		
TST 02-06	Table Glass Retainer	4		
TST 02-07	Water Tight Packing 600	2		
TST 02-08	" " " 400	2		
TST 02-09	" " " 300	4		
TST 02-10	Screen Frame	1		
TST 13-01	Control Unit Housing	2		
TST 13-02	Player Switch Bracket	1		
TST 13-03	Shift Lever Knob	2		
TST 13-04	Vibration Proof Rubber	2		
TST 13-05	Rubber Washer	4		
TST 13-06	Main Operation Panel	1		
TST 13-07	Sub Operation Panel	1		
TST 13-08	1-Player Switch (blue)	1		
TST 13-09	2-Player Switch (green)	1		
TST 13-10	Fire Switch	2		
TST 13-11	Warp Switch	2		
TST 13-12	Fire & Warp Switch Bracket	2		
TST 13-13	Shift Lever Micro Switch	4		
TST 13-14	Blind Plate	2		

No.	Name of Parts	Q'ty	Remarks	FOB Japan per pc.
TST 13-15	Shift lever Ass'y	2		
TST 13-16	Shift Lever Ass'y Base	2		
TST 13-17	Shift Lever	2		
TST 13-18	Shift Lever Pin	2		
TST 13-19	E Ring	4		
TST 13-20	Collar	4		
TST 13-21	Slide Pin Bracket(Large)	4		
TST 13-22	Slide Pin Bracket(Small)	4		
TST 13-23	Compression Spring	4		
TST 13-24	Slide Pin	4		
TST 13-25	Nylon Washer	4		
TST 13-26	Nut Plate	4		
TST 13-27	Stay	4		
TST 13-28	Shift Lever Plate	2		
TST 13-29	Shift Lever Collar	2		
TST 04-00	Video Monitor	1		
TST 04-12	Speaker	1		
TST 05-00	CPU P.C.Board	1		
TST 06-00	VIDEO P.C.Board	1		
TST 07-00	ESS P.C.Board	1		
TST 08-00	Power P.C.Board	1		
TST 08-32	Power Transformer Unit	1		
TST 09-02	Power Cord	1		
TST 09-04	50P Flat Cable	2		
TST 09-05	17P Main Switch Harness Wire	1		
TST 09-06	12P Sub Switch Harness Wire	1		
TST 09-07	15P ESS Harness Wire	1		
TST 09-08	10P VIDEO Harness Wire	1		
TST 09-09	2P Counter Harness Wire	1		
TST 09-10	9P CPU Harness Wire	1		
TST 09-11	3P Coin Harness Wire	1		
TST 09-12	5P Service Switch Harness Wire	1		
TST 09-16	2P Speaker Harness Wire	1		
TST 09-17	34P Flat Cable	1		
TST 09-18	4P Audio Harness Wire	1		

2. CPU P.C.Board

No.	Name of Parts	Q'ty	Remarks	FOB Japan per pc.
TST 05-00	CPU P.C.Board	1	Complete Set	
TST 05-01	IC Z-80A	1	8 Bit Microprocessor	
TST 05-02	" SN74S04	1	S Hex Inverter	
TST 05-03	" SN74LS161	5	Synchronous Presettable 4 Bit Binary Counter W/Direct Reset	
TST 05-04	" SN74LS74	4	Dual D-Type Edge-Triggered Flip Flop W/Set and Reset	
TST 05-05	" SN74LS55	1	2-Wide 4-Input AND-OR-INVERTER Gate	
TST 05-06	" SN74LS86	4	Quadruple 2-Input Exclusive OR Gate	
TST 05-07	" SN74LS367	7	Hex Bus Driver W/3-State Output	
TST 05-08	" SN74LS04	3	Hex Inverter	
TST 05-09	" SN74LS10	1	Triple 3-Input Positive NAND Gate	
TST 05-10	" SN74LS109	1	Dual J-K Positive Edge Triggered Flip Flop W/Set and Reset	
TST 05-11	" 8216	2	Buffer and Line Driver	
TST 05-12	" SN74LS00	5	Quadruple 2-Input Positive NAND Gate	
TST 05-13	" SN7437	1	Quadruple 2-Input NAND Buffer Dual D-Type Edge-Triggered Flip Flop W/Set and Reset	
TST 05-14	" SN74LS138	2	3-to 8 Line Decoder/Demultiplexer	
TST 05-15	" SN74LS139	1	Dual 2-to 4 Line Decoder/Demultiplexer	
TST 05-16	" SN74LS08	1	Quadruple 2-Input Positive AND Gate	
TST 05-17	" SN74LS14	1	Hex Schmitt Trigger Inverter	
TST 05-18	" SN74123	1	Dual Retriggerable Mono-Stable Multi-vibrator	
TST 05-19	" SN74LS174	2	Hex D-Type Flip Flop W/Reset	
TST 05-20	" 8212	1	8 Bit Input/Output Port	
TST 05-21	" 2114	4	4096 Bit Static RAM	
TST 05-22	" SN74LS240	3	Octal Buffer/Line Driver/Line Receiver W/3-State Output	
TST 05-23	" 2716	8	2K Bit EP ROM	

No.	Name of Parts	Q'ty	Remarks	FOB Japan per pc.
TST 05-24	Crystal Oscillator	1	20.160 MHz.	
TST 05-25	" "	1	8.00 MHz.	
TST 05-26	Dip Switch	1	B-6A	
TST 05-27	Transistor	1	2SC2235-0	
TST 05-28	Diode	1	1S1595 (SF-1)	
TST 05-29	"	1	S5277B	
TST 05-30	"	4	1S2076	
TST 05-31	Electrolytic Capacitor	1	220 μ F 16V	
TST 05-32	" "	2	47 μ F 10V	
TST 05-33	" "	1	33 μ F 16V	
TST 05-34	" "	1	3.3 μ F 50V	
TST 05-35	" "	11	10 μ F 16V	
TST 05-36	" "	1	1 μ F 16V	
TST 05-37	Ceramic Capacitor	3	0.01 μ F 50V	
TST 05-38	" "	38	0.068 μ F 25V	
TST 05-39	" "	1	330pF 50V	
TST 05-40	" "	1	180pF 50V	
TST 05-41	" "	1	1000pF 50V	
TST 05-42	" "	1	10 μ F 10V	
TST 05-43	Resistor	1	110 Ω $\frac{1}{2}$ W $\pm 5\%$	
TST 05-44	"	2	330 Ω $\frac{1}{4}$ W "	
TST 05-45	"	2	820 Ω " "	
TST 05-46	"	18	1K Ω " "	
TST 05-47	"	2	10K Ω " "	
TST 05-48	"	2	33K Ω " "	
TST 05-49	Resistor Array (Parallel)	6	68 Ω 4 elements	
TST 05-50	" "	4	1K Ω 8 elements	

3. VIDEO P.C.Board

No.	Name of Parts	Q'ty	Remarks	FOB Japan per pc.
TST 06-00	VIDEO P.C.Board	1	Complete Set	
TST 06-01	IC SN74LS161	5	Synchronous Presettable 4-Bit Binary Counter W/Direct Reset	
TST 06-02	" SN74LS74	2	Dual D-Type Edge-Treiggered Flip Flop W/Set and Reset	
TST 06-03	" SN74LS157	6	Quadruple 2-Line to 1-Line Data Selector/Multiplexer	
TST 06-04	" SN74LS139	1	Dual 2-to 4-Line Decoder/Demultiplexer	
TST 06-05	" SN74LS164	2	8-Bit Serial-In Parallel-Out Shift Resistor	
TST 06-06	" 22Pin	8	256 x 1 RAM	
TST 06-07	" SN74LS283	3	4 Bit Binary Full Adder W/Fast Carry	
TST 06-08	" MB7063	2	64x9 Bit Bipolar TTL RAM	
TST 06-09	" SN74LS174	5	Hex D-Type Flip Flop with Reset	
TST 06-10	" 2716	2	2K Bit EP-ROM	
TST 06-11	" SN74LS377	2	Octal D-Type Flip Flop	
TST 06-12	" SN74198	2	8-Bit Shift Resister	
TST 06-13	" MB7051	1	256 Bit Bipolar P-ROM	
TST 06-14	" SN74LS145	1	BCD-to Decimal Decoder/Driver	
TST 06-15	" MB7052	1	1024 Bit Bipolar P-ROM	
TST 06-16	" SN74LS195	1	4-Bit Parallel Access Shift Resister	
TST 06-17	" 27LS00	1	256 Bit Bipolar RAM	
TST 06-18	" SN74LS368	2	Hex Bus Driver W/3-State Output (Inverted)	
TST 06-19	" SN74LS08	2	Quadruple 2-Input Positive AND Gate	
TST 06-20	" SN74LS00	7	Quadruple 2-Input Positive NAND Gate	
TST 06-21	" SN74LS02	1	Quanruple 2-Input Positive NOR Gate	
TST 06-22	" SN74LS20	1	Dual 4-Input Positive NAND Gate	
TST 06-23	" SN74LS86	2	Quadruple 2-Input Exclusive OR Gate	
TST 06-24	" SN74LS04	2	Hex Inverter	

No.	Name of Parts	Q'ty	Remarks	FOB Japan per pc.
TST 06-25	Transistor	7	2SC1815	
TST 06-26	Diode	1	1S1595 (SF-1)	
TST 06-27	"	3	1S2076	
TST 06-28	Electrolytic Capacitor	1	220 μ F 16V	
TST 06-29	" "	3	10 μ F 16V	
TST 06-30	" "	2	33 μ F 16V	
TST 06-31	Ceramic Capacitor	3	22pF 50V	
TST 06-32	" "	4	330pF 50V	
TST 06-33	" "	1	470pF 50V	
TST 06-34	" "	33	0.068 μ F 25V	
TST 06-35	" "	1	180pF 50V	
TST 06-36	Resistor (Carbon)	1	2K Ω $\frac{1}{4}$ W $\pm 5\%$	
TST 06-37	"	1	7.5K Ω " "	
TST 06-38	"	4	100 Ω " "	
TST 06-39	"	4	330 Ω " "	
TST 06-40	"	4	51 Ω " "	
TST 06-41	"	3	20K Ω " "	
TST 06-42	"	3	82K Ω " "	
TST 06-43	"	3	9.1K Ω " "	
TST 06-44	"	3	3K Ω " "	
TST 06-45	"	3	200 Ω " "	
TST 06-46	"	5	220 Ω " "	
TST 06-47	"	10	470 Ω " "	
TST 06-48	"	1	820 Ω " "	
TST 06-49	"	1	68 Ω " "	
TST 06-50	"	13	1K Ω " "	
TST 06-51	"	1	3 Ω " "	
TST 06-52	"	1	16 Ω " "	
TST 06-53	"	1	27 Ω " "	
TST 06-54	Resistor Array	2	1K Ω 1/8W $\pm 5\%$ 9 elements	
TST 06-55	" "	1	1K Ω " " 4 elements	

4. ESS P.C.Board

No.	Name of Parts	Q'ty	Remarks	FOB Japan per pc.
TST 07-00	ESS P.C.Board	1	Complete Set	
TST 07-01	IC SN74LS04	3	Hex Inverter	
TST 07-02	" SN74LS00	1	Quadruple 2-Input Positive NAND Gate	
TST 07-03	" SN74LS10	3	Triple 3-Input Positive NAND Gate	
TST 07-04	" SN74LS86	1	Quadruple 2-Input Exclusive OR Gate	
TST 07-05	" SN74LS02	1	Quadruple 2-Input Positive NOR Gate	
TST 07-06	" SN74LS30	1	8-Input Positive NAND Gate	
TST 07-07	" SN74LS74	1	Dual D-Type Edge Triggered Flip Flop W/Set and Reset	
TST 07-08	" SN74LS164	5	8-Bit Serial-In Parallel-Out Shift Register	
TST 07-09	" SN74LS75	2	Quadruple Bistable Latch	
TST 07-10	" 8035	1	8-Bit Microprocessor	
TST 07-11	" 2708	1	1K Bit EP ROM	
TST 07-12	" DAC-08	1	8-Bit Digital-to-Analog Converter (CQ Rank)	
TST 07-13	" SN74LS05	2	Hex Inverter W/Open Collector Output	
TST 07-14	" LM324	2	Operational Amplifiers	
TST 07-15	" CA3080	2	Operational Transconductance Amplifiers	
TST 07-16	" MB3712	1	5.7W Audio Power Amplifier	
TST 07-17	" NE555	1	Precision Timers	
TST 07-18	Transistor	9	2SC1815	
TST 07-19	"	1	2SA733R	
TST 07-20	Diode	12	1SS53	
TST 07-21	Electrolytic Capacitor	5	220 μ F 16V	
TST 07-22	"	2	47 μ F 10V	
TST 07-23	"	2	22 μ F 10V \pm 20%	
TST 07-24	"	1	22 μ F 10V	
TST 07-25	"	2	10 μ F 16V	
TST 07-26	"	1	4.7 μ F 35V	
TST 07-27	"	2	3.3 μ F 50V	
TST 07-28	"	1	1 μ F 50V \pm 20%	
TST 07-29	"	7	1 μ F 50V	

No.	Name of Parts	Q'ty	Remarks	FOB Japan per pc.
TST 07-30	Ceramic Capacitor	18	0.068 μ F 25V	
TST 07-31	" "	1	0.022 μ F 50V	
TST 07-32	" "	3	0.01 μ F 50V	
TST 07-33	" "	1	1000 pF 50V	
TST 07-34	Resistor(Carbon)	1	3.3 M Ω $\frac{1}{4}$ W \pm 5%	
TST 07-35	"	1	470 K Ω " "	
TST 07-36	"	3	200 K Ω " "	
TST 07-37	"	3	100 K Ω " "	
TST 07-38	"	3	47 K Ω " "	
TST 07-39	"	1	30 K Ω " "	
TST 07-40	"	3	20 K Ω " "	
TST 07-41	"	22	10 K Ω " "	
TST 07-42	"	1	6.2 K Ω " "	
TST 07-43	"	3	5.6 K Ω " "	
TST 07-44	"	6	4.7 K Ω " "	
TST 07-45	"	1	3.3 K Ω " "	
TST 07-46	"	1	3 K Ω " "	
TST 07-47	"	6	2.2 K Ω " "	
TST 07-48	"	3	2 K Ω " "	
TST 07-49	"	1	1.2 K Ω " "	
TST 07-50	"	7	1 K Ω " "	
TST 07-51	"	1	470 Ω " "	
TST 07-52	"	1	330 Ω " "	
TST 07-53	"	1	20 Ω " "	
TST 07-54	"	2	1 Ω " "	
TST 07-55	Semi-Fixed Resistor	1	10 K Ω 1/3W	
TST 07-56	" " "	2	1 K Ω 1/5W	

5. Power P.C.Board

No.	Name of Parts	Qty	Remarks	FOB Japan per pc.
TST 08-00	Power P.C.Board	1	Complete Set	
TST 08-01	Silicon Rectifier Diode	1	4B4B41 4A Bridge	
TST 08-02	" " "	2	1B4B41 1A Bridge	
TST 08-03	IC 3-D-0050	2	Switching Regulator IC	
TST 08-04	" TA7089	1	Regulator IC	
TST 08-05	" 78M24	1	24V Regulator IC	
TST 08-06	Transistor	2	2SA1012	
TST 08-07	"	1	2SA817	
TST 08-08	"	1	2SC2562	
TST 08-09	Resistor (Carbon)	2	100Ω $\frac{1}{4}$ W	
TST 08-10	" "	5	1 KΩ "	
TST 08-11	" "	1	3.3KΩ "	
TST 08-12	" "	1	5.1KΩ "	
TST 08-13	" "	1	15 KΩ "	
TST 08-14	" (Cement)	1	0.03Ω 2W	
TST 08-15	" "	1	1Ω "	
TST 08-16	" (Coil Winding)	1	0.1Ω 1W	
TST 08-17	" (Metal)	1	100Ω 2W	
TST 08-18	" "	1	510Ω 1W	
TST 08-19	Variable Resistor	3	B2KΩ	
TST 08-20	" "	2	B50KΩ	
TST 08-21	Electrolytic Capacitor	2	2200μF 16V	
TST 08-22	" "	2	3300μF 16V	
TST 08-23	" "	3	10 μF 16V	
TST 08-24	" "	1	1000μF 35V	
TST 08-25	" "	1	1000μF 16V	
TST 08-26	" "	1	47 μF 25V	
TST 08-27	Mylar Capacitor	1	1000pF 50V	
TST 08-28	Diode	1	CTB24 Shot Key Diode	
TST 08-29	"	1	IS1834 Fast Recovery Diode	
TST 08-30	Choke Coil	1	3A 200μH	
TST 08-31	" "	1	0.5A 400μH	