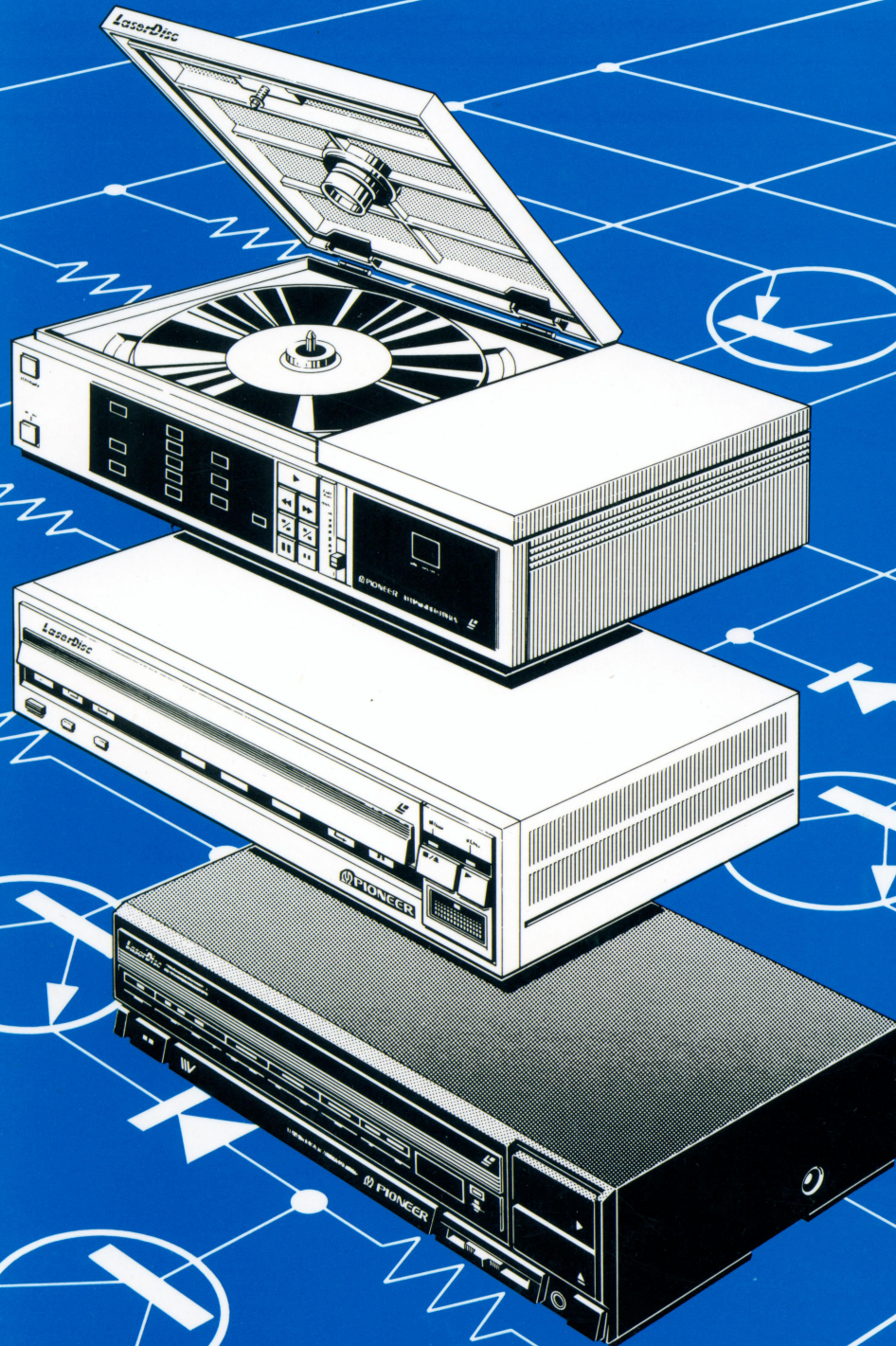


Repair Guide for Laser Vision Players

ORDER NO. GGF-613



Repair Guide for Laser Vision Players

This repair guide summarizes important and up-to-date information for your Laser Vision (LV) player service activities. It will provide you with the following:

- Main operational flow charts
- Check points in each Servo loop circuit
- Problems caused by Pick-up failure
- Service techniques
- Tools needed for each type of repair job
- Main IC's employed in circuits
- Block diagram for Servo loop circuits
- Troubleshooting

More than 10 years have passed since our first LV player was introduced. Since LV player has become more and more popular around the world, we expect that you've had more and more opportunities to familiarize yourself with the most common repair problems.

According to our data, many failures in LV players are due to malfunctioning pickups. Most of these problems can be simply and quickly solved by replacing the pickup and/or adjusting Servo mechanism.

On the other hand, some failures in electrical circuits have required excessively long repair time. Therefore, in this repair guide, the contents have been arranged emphasizing the repair data for electrical circuit failures.

Also, in the first part of this book, the operational flow charts of main models will show you the main operational processes from Power ON to Play and will give you a basic understanding of the LV players you'll service.

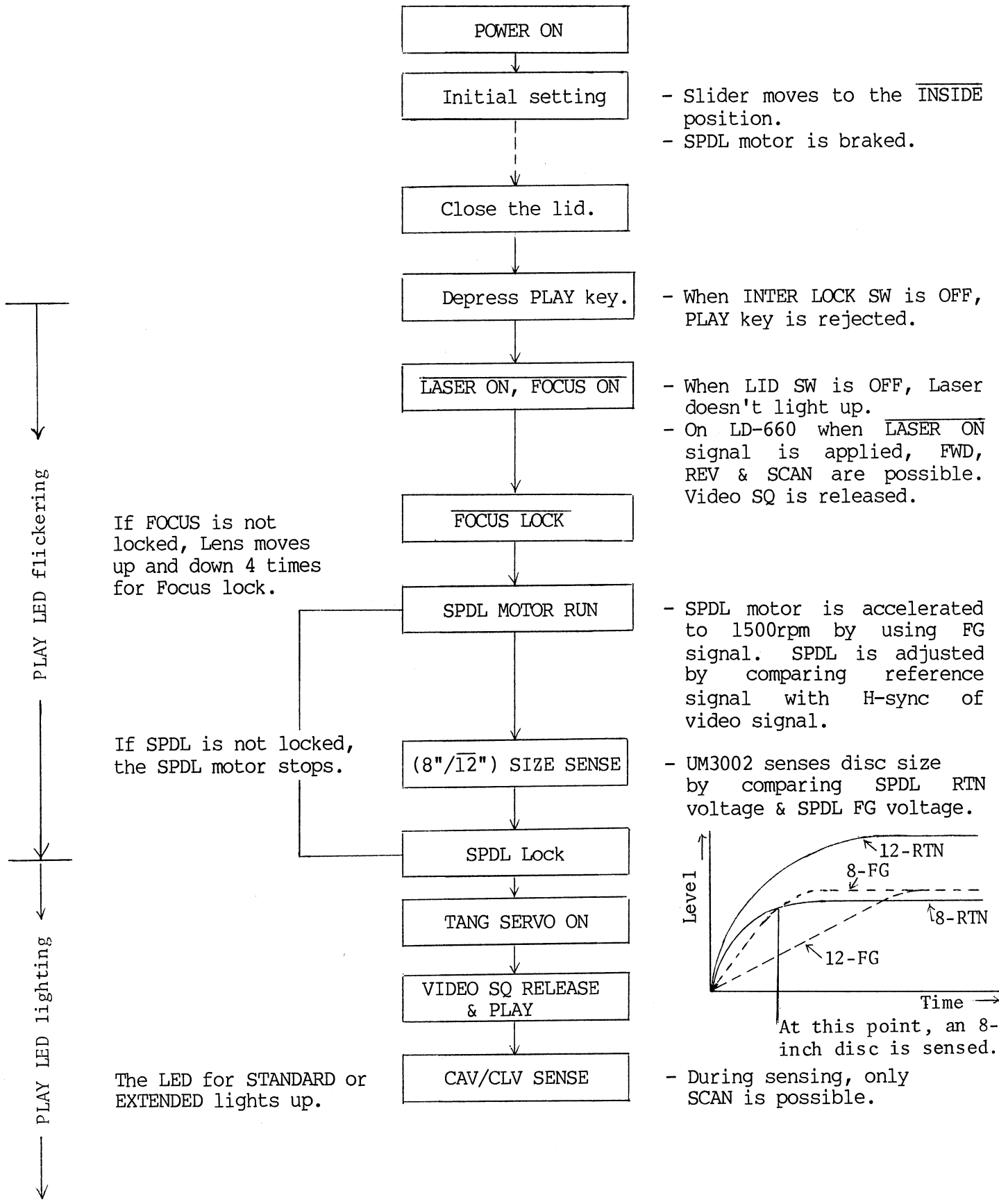
We hope that this book will be a helpful guide to improving your LV player services.

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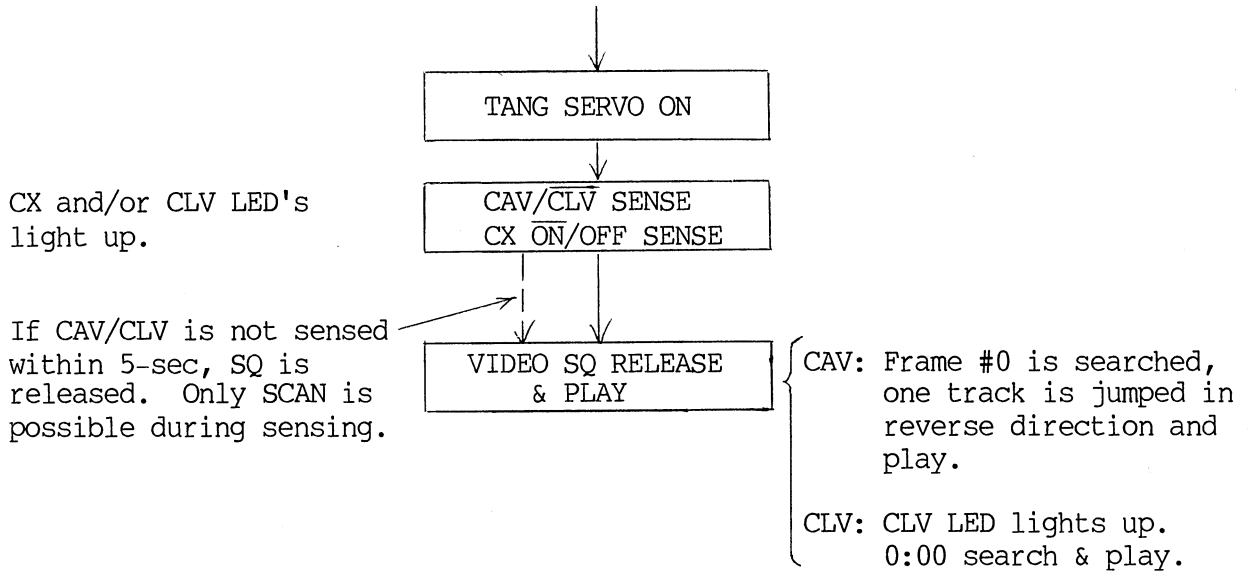
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Main models' operational flow charts

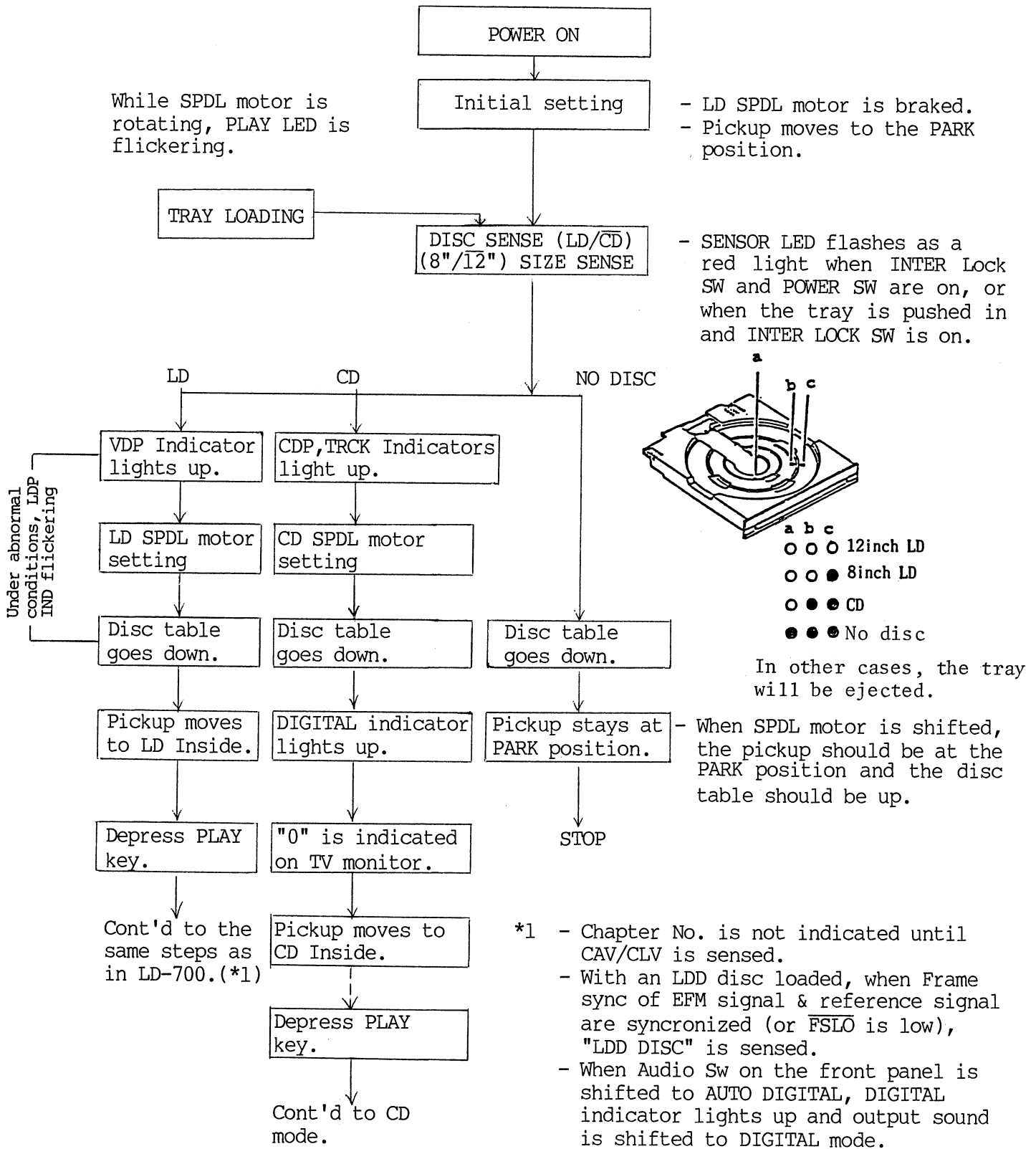
LD-1100 series operational flow chart
[from POWER ON to PLAY]



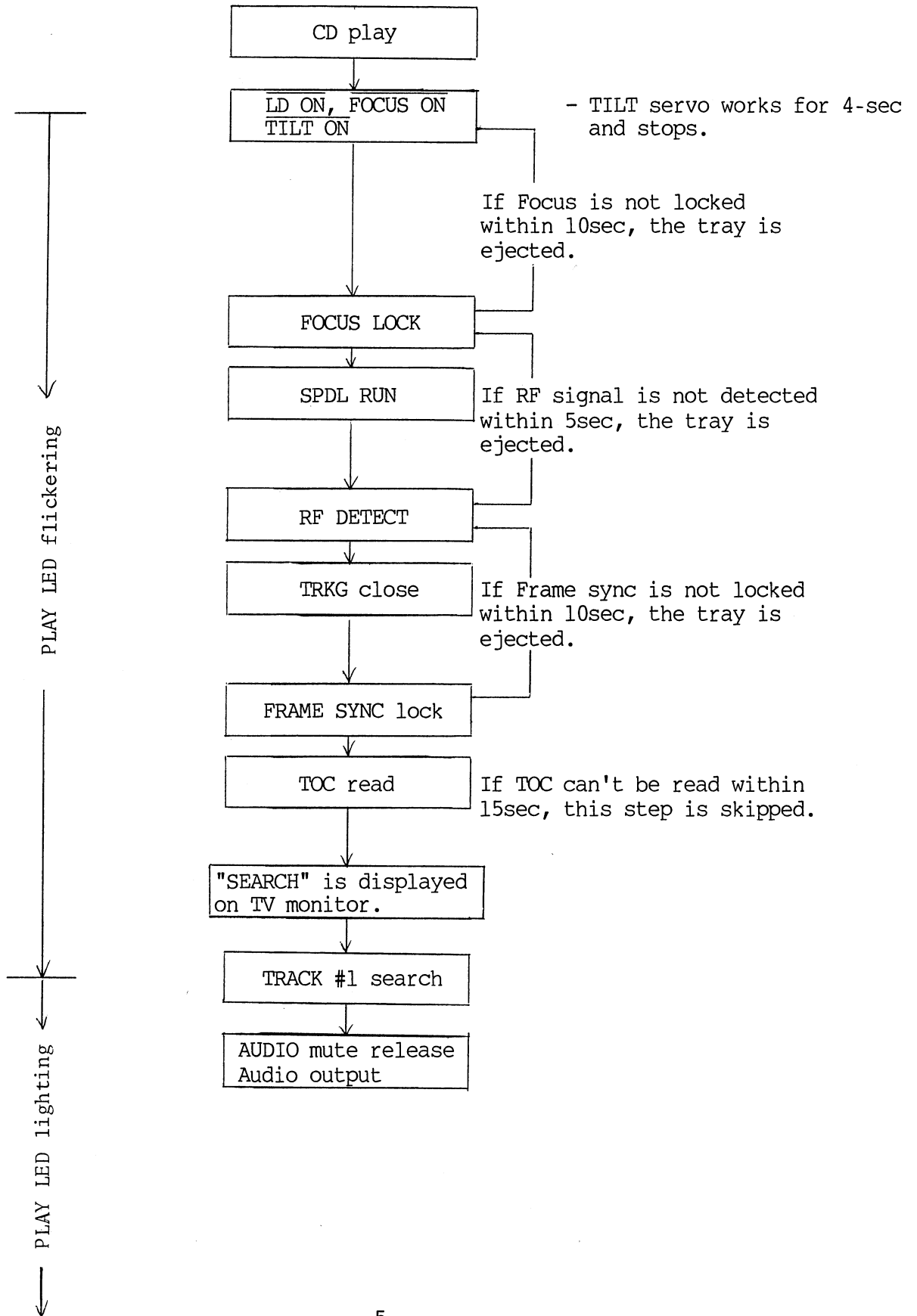
↓ PLAY LED lighting ↓



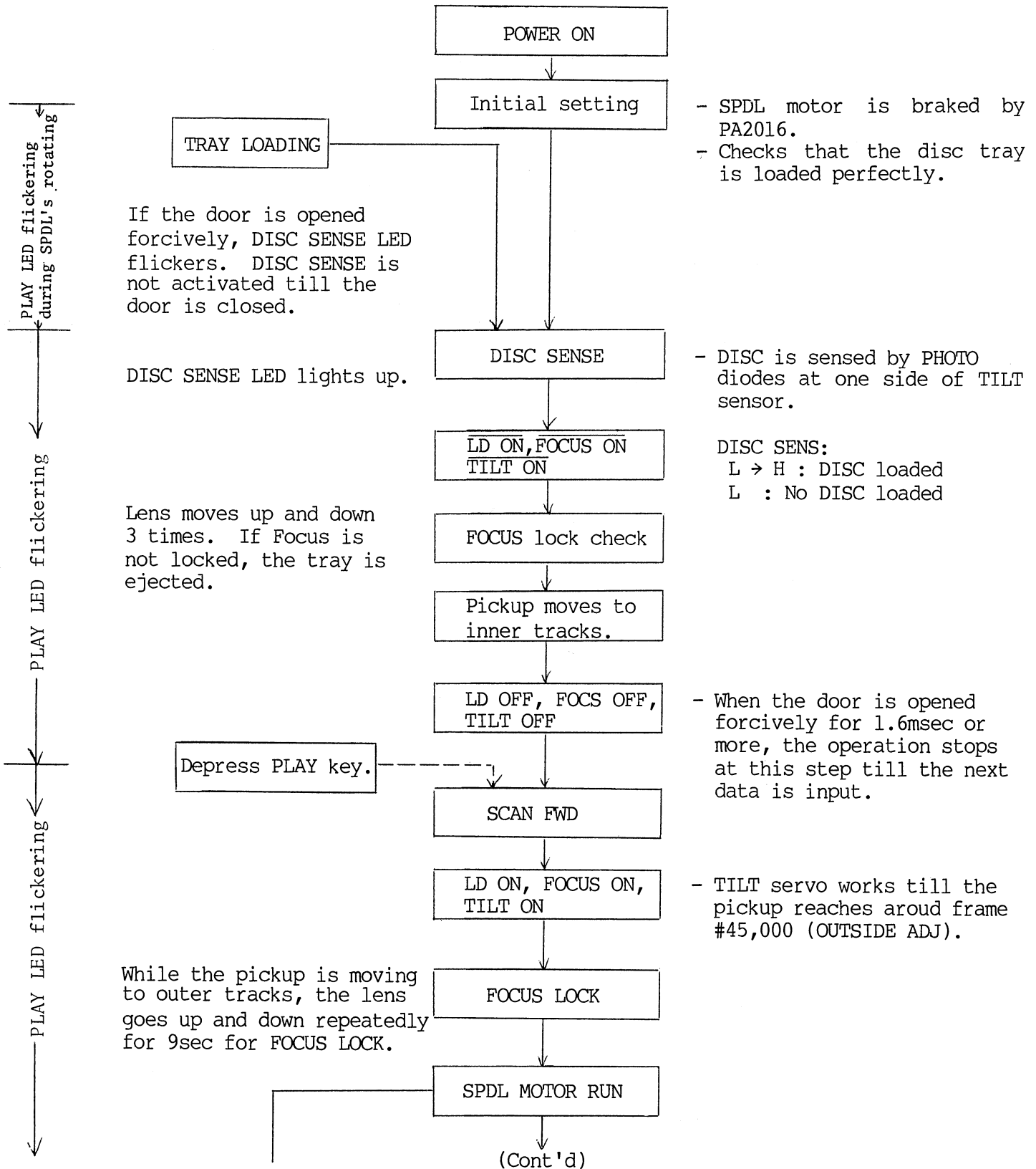
CLD-900 operational flow chart
[from POWER ON to DISC LOADING]



CLD-900 operational flow chart
 [PLAY in CD mode]



LD-707 series operational flow chart
[from POWER ON to PLAY]

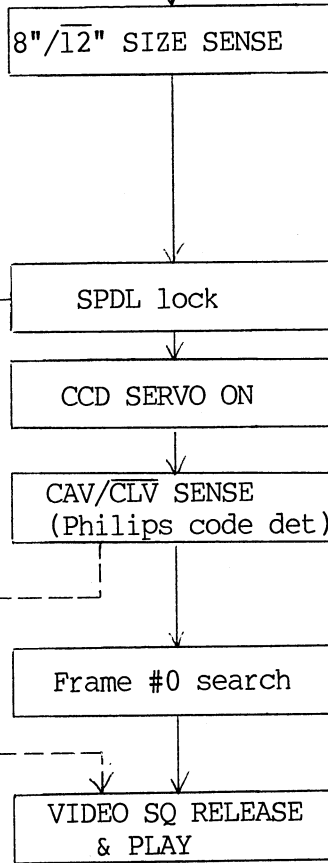


PLAY LED flickering
 PLAY LED lighting
 PLAY LED lighting

If SPDL is not locked within 60sec, the tray is ejected.

CX and/or CLV LED's light up.

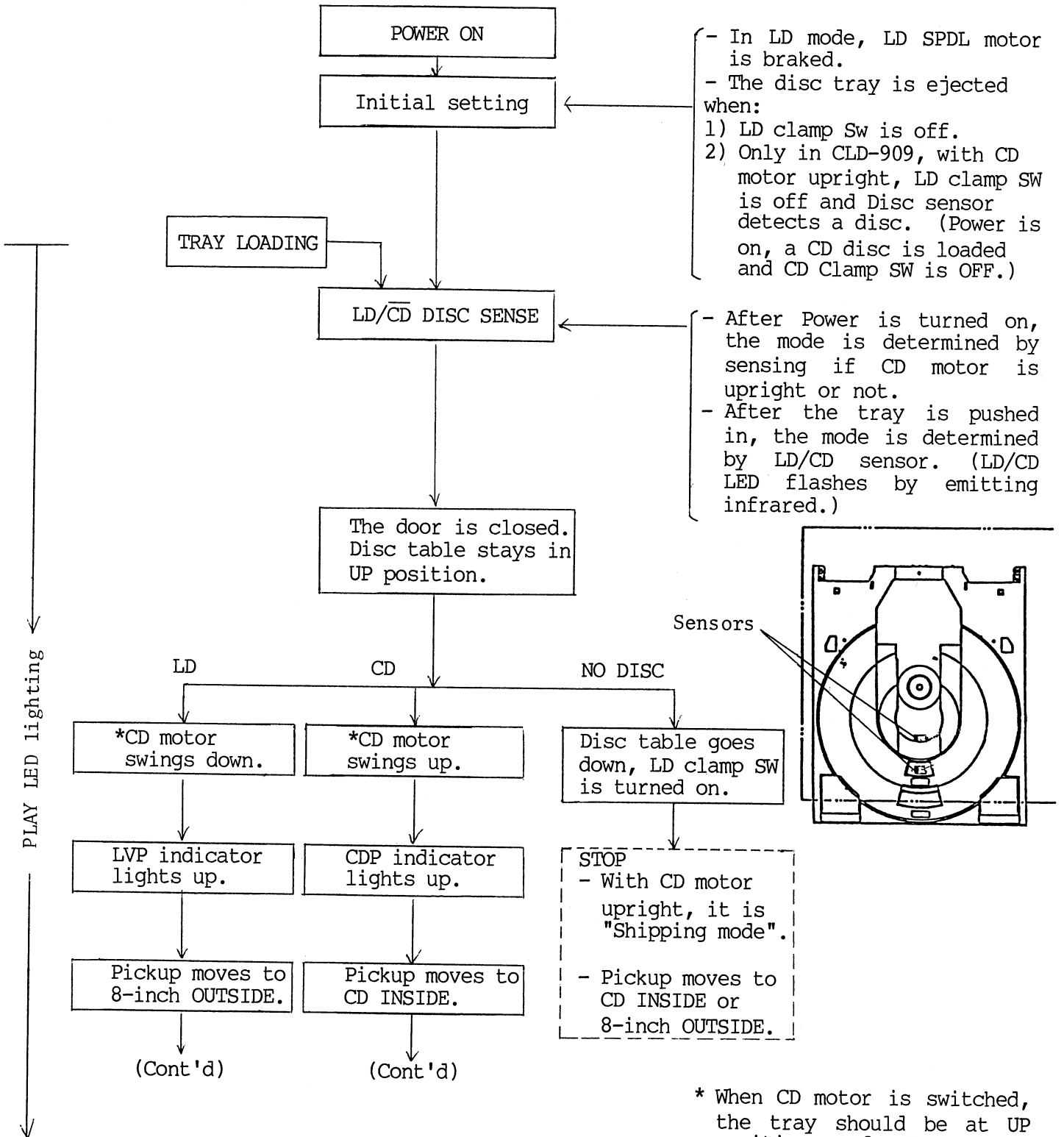
If Philips code can't be read within 0.5msec, SQ is released and Play starts. Only SCAN is possible during sensing.



- Disc size (8"/12") is sensed by detecting the SPDL-MOTOR acceleration time from 250rpm to 1650rpm.
- Cont IC keeps this date until the tray is ejected.

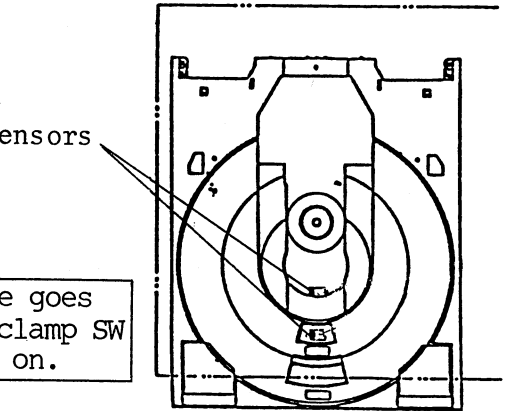
- If track search can't be done within 20sec, it stops and Play starts.

CLD-909 & 1010 operational flow chart
[from POWER ON to DISC LOADING]



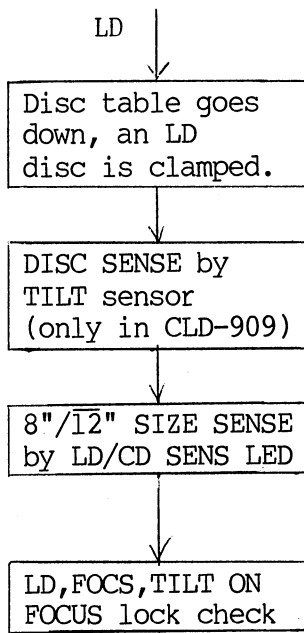
- In LD mode, LD SPDL motor is braked.
- The disc tray is ejected when:
1) LD clamp Sw is off.
2) Only in CLD-909, with CD motor upright, LD clamp SW is off and Disc sensor detects a disc. (Power is on, a CD disc is loaded and CD Clamp SW is OFF.)

- After Power is turned on, the mode is determined by sensing if CD motor is upright or not.
- After the tray is pushed in, the mode is determined by LD/CD sensor. (LD/CD LED flashes by emitting infrared.)

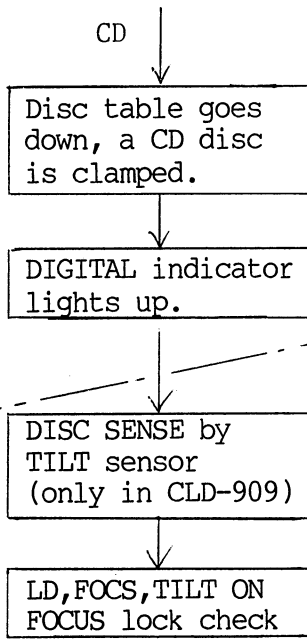


* When CD motor is switched, the tray should be at UP position and the pickup should be moved to 12-inch OUTSIDE.

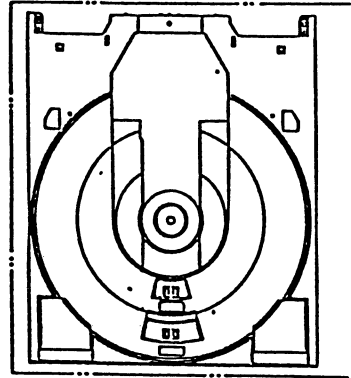
PLAY LED
lighting



Cont'd to the same steps as in LD-707 PLAY

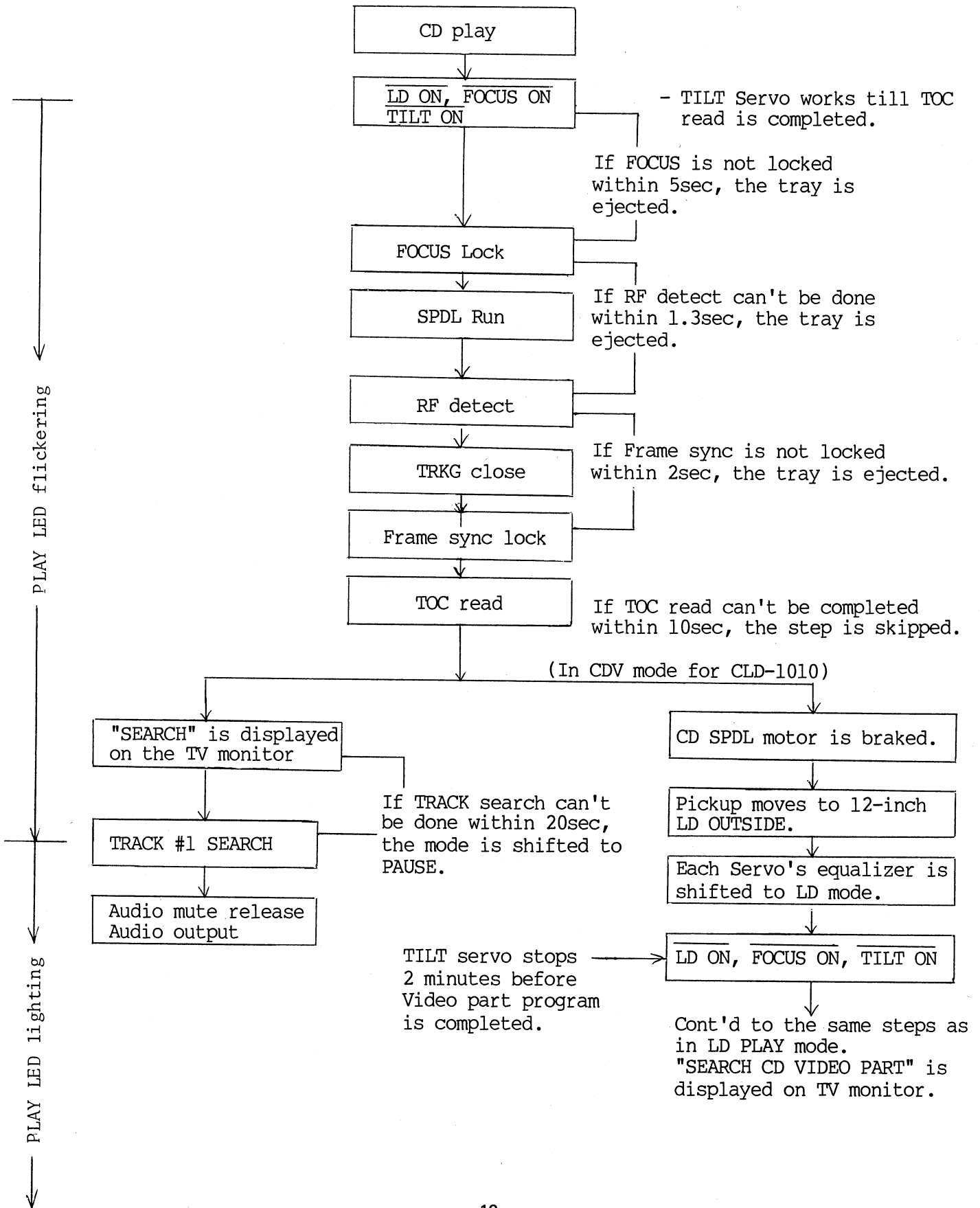


Cont'd to CD PLAY



- If FOCUS is not locked within 3sec, the try is ejected.

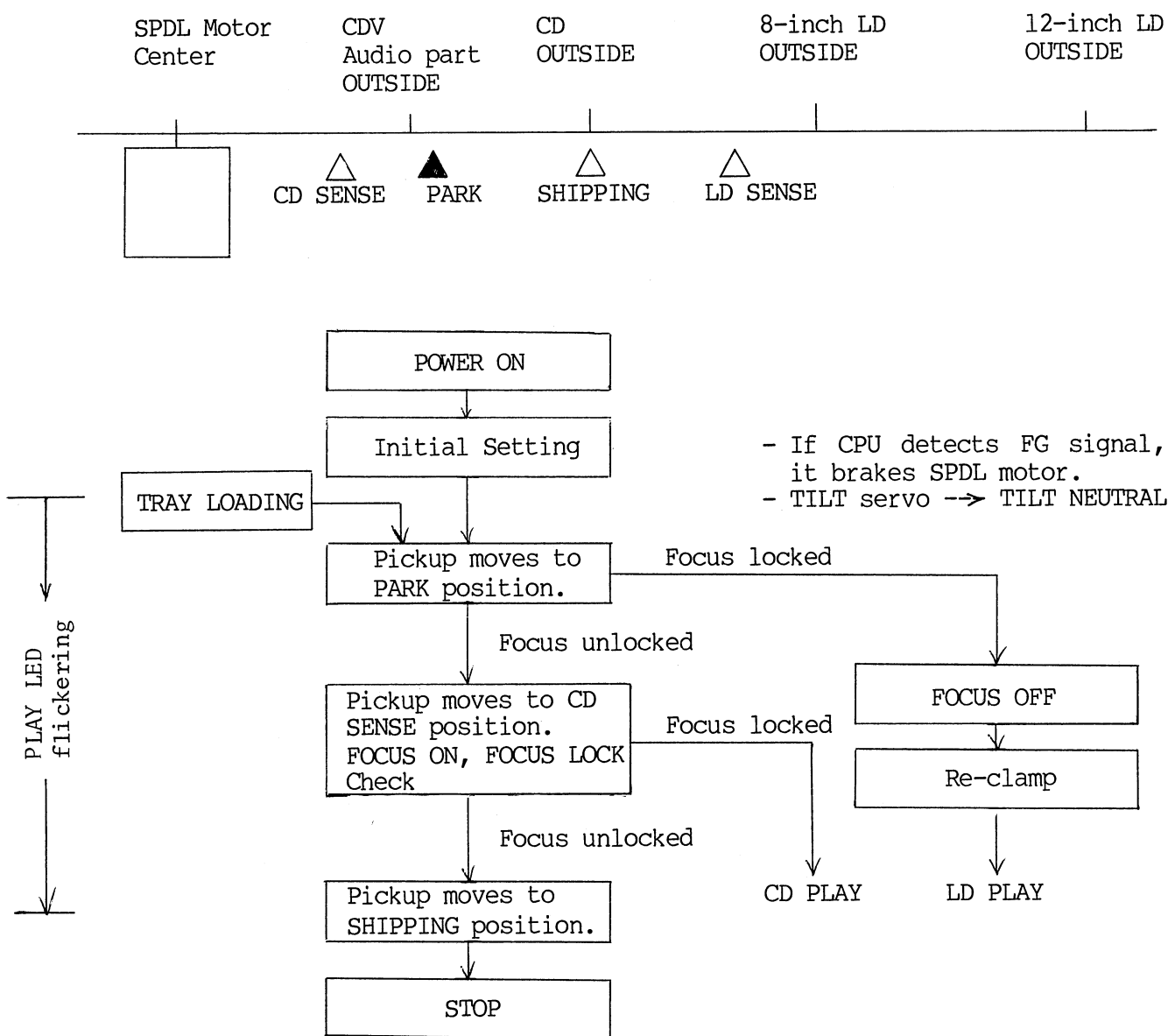
CLD-909 & 1010 operational flow chart
 [PLAY in CD mode]



CLD-3030 series operational flow chart
 [From POWER ON to DISC LOADING]

In CLD-3030 series, there is one Mechanical Switch to detect Pickup positions. The following four positions for the Pickup are predetermined:

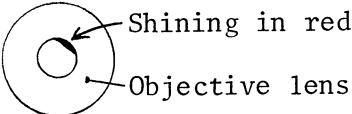
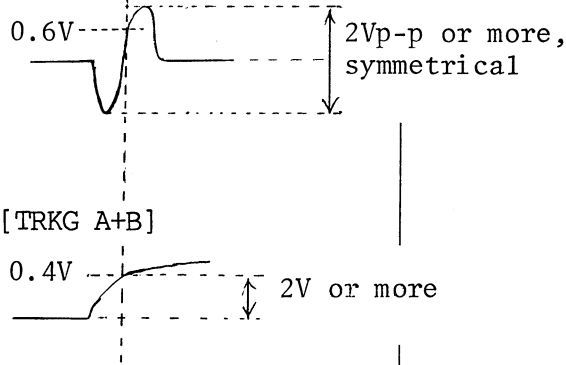
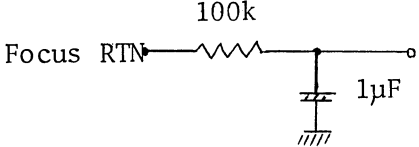
- 1) PARK position: The position of Mechanical Switch, the starting point of Video part in CDV mode
- 2) LD SENSE position: The position after 1sec FWD SCAN at PARK position
- 3) CD SENSE position: The position after 300msec REV SCAN at PARK position
- 4) SHIPPING position: The position after 240msec FWD SCAN at PARK position



Check points in SERVO loop circuits

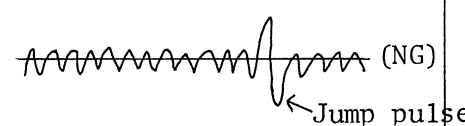
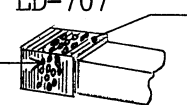
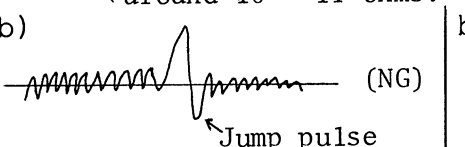
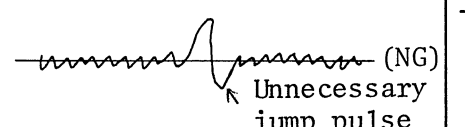

FOCUS SERVO

- Main problems:
- SPDL motor doesn't rotate.
 - FOCUS servo lock is released during Play.

Main check points	Check method	Failure points
<p>1) Laser lighting, Lens UP/DOWN operation</p>	<p>Depress the PLAY key and confirm the following:</p> <ul style="list-style-type: none"> - Laser lights up. *In case of Laser tube, red laser beam can be seen. *In case of Laser diode, red laser beam is emitted to the objective lens.  <p style="margin-left: 20px;">Shining in red Objective lens</p> <ul style="list-style-type: none"> - The lens smoothly goes up and down. 	<p>When both Laser and Lens are defective, FOCUS ON signal doesn't become low.</p> <ul style="list-style-type: none"> - DISC SENSE: NG - Initial setting: NG
<p>2) FOCUS Error & TRKG A+B signals</p>	<p>Load a disc and depress the PLAY key.</p> <ul style="list-style-type: none"> - When the following conditions are satisfied, FOCUS is locked: [FOCUS ERROR]  <p style="margin-left: 20px;">0.6V 2Vp-p or more, symmetrical</p> <p style="margin-left: 20px;">[TRKG A+B]</p> <p style="margin-left: 20px;">0.4V 2V or more</p>	<p>When FOCUS Error & TRKG A+B signals are NG:</p> <ul style="list-style-type: none"> - Pickup failure - Pickup or SPDL motor is tilted. (TILT SERVO failure)
<p>3) FOCUS RETURN signal (in PLAY mode)</p>	<ul style="list-style-type: none"> - Confirm that DC voltage doesn't vary in inner and outer tracks by using a low pass filter.  <p style="margin-left: 20px;">100k</p> <p style="margin-left: 20px;">Focus RTN</p> <p style="margin-left: 40px;">1µF</p>	<p>When the DC voltage varies, Slider shaft or SPDL motor is tilted.</p>

TRACKING SERVO

- Main problems:
- Picture skipping
 - SPDL motor rotates, but it is not locked.
 - Mis-search or no search

Main check points	Check method	Failure points
1) Grating & Tracking balance	- Re-adjustment	- Adjustment deviation
2) Track Error waveform	<p>When TRKG loop is closed (in STILL mode), observe Track Error waveform.</p> <p>a) *In all models except LD-707</p> <p>TRKG coil is shorted. →  (NG)</p> <p>*In LD-707</p> <p>Bubbles made by TRKG coil's heat →  (TRKG coil resistance should be around 10 - 11 ohms.)</p> <p>b) TRKG Error is oscillating. (TRKG SERVO is noisy.) →  (NG)</p>	<p>a) -TRKG gain is too low. -TRKG coil is almost short-circuited.</p> <p>b) -TRKG gain is too high.</p>
An unnecessary jump pulse in Play mode →	<p>In PLAY mode, observe Track Error waveform.</p> <p> (NG)</p>	- Scratches on a disc causes track skipping.
3) TRKG Error & TRKG A+B Lissajous figures	<p>After grating is adjusted at Frame #15,000 (#16,000), observe Lissajous figures at Frame #700 (#700) with TRKG loop opened.</p> <p>-Confirm the Y-axis level is minimum.</p> <p style="text-align: center;">  #15,000 #700 </p>	<p>*The frame numbers in the parentheses are for N-series test discs: the others are for F-series test discs.</p> <p>- When the Y-axis level is not minimum, motor center position is deviated.</p>

SLIDER SERVO

- Main problems:
- No play
 - Picture skipping
 - Mis-search or no search

Main check points	Check method	Failure points
1) Slider movement with power ON.	<p>a. Move Pickup to outer tracks & turn Power on. -Confirm that the pickup moves to INSIDE position.</p> <p>b. Confirm that the following signals are applied to Slider control IC: -SCAN ON/OFF --- H -SCAN F/R --- L -SCAN H/L --- L</p>	<p>NG: Slider motor failure</p> <p>NG: Control IC failure</p>
2) TRKG RTN (SLIDER DRIVE) signal	<p>During PLAY, Slider motor is driven by the DC element of TRKG RTN signal. So, confirm that the DC element doesn't change suddenly.</p>	<p>NG: Stiff Slider movement</p>

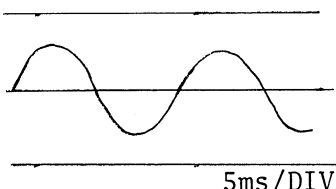
SPINDLE SERVO

- Main problems:
- Intermittently SPDL Motor doesn't rotate.
 - SPDL motor can't be accelerated to 1800rpm.
 - Uncontrollable SPDL-motor speed
 - Out of Sync picture

Main check points	Check method	Failure points
1) Motor has a dead point.	<ul style="list-style-type: none"> - Preventing disc rotating manually, depress the PLAY key. - Slowly rotate a disc by hand. If a disc sticks at a point, SPDL motor has a dead point. 	<ul style="list-style-type: none"> - Defective Motor ass'y (DRIVE Transistor failure, etc.)
2) FG signal	<ul style="list-style-type: none"> - Are FG pulses generated continuously? <p>*LD-700 ~ LD-838D: 12 pulses/revolution (360Hz/1800rpm)</p> <p>*LD-S1 & CLD-99S: 6 pulses/revolution (180Hz/1800rpm)</p>	NO: Defective Motor ass'y
3) Ref H & PB H	<ul style="list-style-type: none"> - Is Ref H divided from X'tal as a reference signal and generated? - Is PB H extracted from Video signal? 	NO:- Defective X'tal, <ul style="list-style-type: none"> - Defective H-sync Sep circuit - Defective Phase Comparator circuit
4) SPDL Lock signal	<ul style="list-style-type: none"> - When picture is out of sync, TANG SERVO may be defective. So, open TANG SERVO. If Picture is not out of sync, TANG SERVO is defective and $\overline{\text{SPDL LOCK}}$ signal is low. 	<ul style="list-style-type: none"> - TANG SERVO failure
5) Check by using an 8-inch disc	When a test disc (12-inch) can't be played, load an 8-inch disc.	When only an 8-inch disc can be played: <ul style="list-style-type: none"> - 8/12 DISC SENSE circuit failure - Gain Switching circuit failure - Motor failure
6) Open TRKG loop.	<ul style="list-style-type: none"> - Is SPDL motor accelerated to 1800rpm? 	NO: <ul style="list-style-type: none"> - H-sync Sep failure - Grating deviation

TANGENTIAL, CCD SERVO

- Main problems:
- Intermittently colorless picture or no color
 - No raster
 - SPDL motor starts but immediately stops (TANG SERVO maintains open.)

Main check points	Check method	Failure points
1) TRAPE waveform	<ul style="list-style-type: none"> - After SPDL motor rotates, open TANG loop. In case of CCD, ground VCO IC INPUT (PA0017-9). - Check Trapezoid waveform. If a 30Hz sine wave appears in the center, SPDL SERVO operation is normal at TRAPE circuit. 	<p>When the optimum signal can't be obtained:</p> <ul style="list-style-type: none"> - SPDL SERVO failure - Sync Sep circuit failure - TRAPE circuit (PHASE comparator circuit) failure
2) CCD clock check Input & output check	<ul style="list-style-type: none"> - When Power is on, does CCD clock oscillate about 9.6MHz? 	<p>NO:</p> <ul style="list-style-type: none"> - IC PA0017 failure - CCD failure

TILT SERVO

- Main Problems:
- Noisy picture (Crosstalk)
 - Focus is unlocked.
 - No play in the models employing TILT sensor as disc sensor (LD-707 series)

Main check points	Check method	Failure points
1) TILT Limit SW	<ul style="list-style-type: none"> a. Confirm that Pickup is parallel to disc surface. (Verify that Tilt Limit SW is not depressed.) b. Basically even without TILT SERVO, play is possible. If the pickup is not parallel to the disc, connect a drycell to TILT motor and set the pickup to the horizontal position. Disconnect the drycell and play. c. For TILT SERVO rough-adjustment, RF signal or TRKG Error signal can be maximum. 	<p>NO: TILT sensor failure</p> <p>When Play is possible, TILT sensor is defective.</p>

Main problems caused by Pickup failure

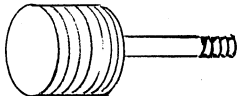
Main problems caused by Pickup failure

- 1) FOCUS SERVO can't be locked.
- 2) Track skipping
- 3) After some-time operation, no play
- 4) Intermittently out of synchronization, or picture warp
- 5) Noisy picture
 - Crosstalk
 - Snow noise
- 6) Ghost
- 7) Horizontal bar noise in picture
- 8) Play only from the half way
- 9) Colorless & out-of-sync picture
- 10) No play in CD mode (in CLD players)

Necessary jigs and tools

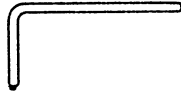
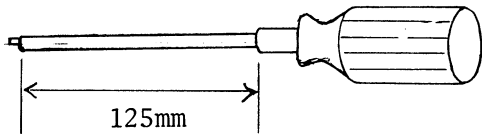
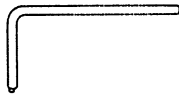
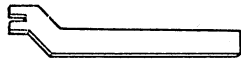
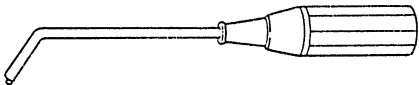
Necessary Jigs & Tools

As of Apr. 1, 1989

APPLICABLE MODEL	DESCRIPTION	JIG NO.
ALL LV players & CLD players	LD test disc 12-inch CAV: (NTSC)	GGV1001
	LD test disc 12-inch CAV:Q1 (PAL)	GGV-143
	LD test disc 8-inch CAV: (NTSC)	GGV1002
	CD test disc	YEDS-7
	Laser power meter	LPM-8000
	Shorting clip (5 pcs.)	GGF-059
	Binder	GEC-010
	Lens cleaning paper	GEM-005
	Cleaning liquid	GEM1004
	FTG adjuster (*1)	GGV-096
LD-1100 series	Grating driver 	GGV-053
	Controller (for LD-V1000)	GGV-100
	PD chopper	GGV-083
	2.5mm Hex driver	GGV-059
	VSOP Adjust box (*1)	GGV-112
	Herness for VSOP ADJ BOX (LD-1100,660:NTSC)(*1)	GGV-111
	Herness for VSOP ADJ BOX (LD-1100,660:PAL) (*1)	GGV-092
	Herness for VSOP ADJ BOX (LD-V1000) (*1)	GGV-099
LD-700, CLD-900 series	PD chopper (*2)	GGV-083
	MIRROR JIG (*2)	GGF-056
	Adaptor cord for PD chopper (*2)	GGF-057
	1.27mm Hex driver (*2)	GGF-059

NOTE: - "*1" marked jigs: Helpful to your service but not available. As for the usage, please refer to Service manuals.
 - "*2" marked jigs: Usable for the Pickup optical-axis quick adjustment in LD-700 & CLD-900.
 - Even if you don't have the jigs marked with "*1" & "*2", your servicing and adjustment can be performed.

Necessary Jigs & Tools

APPLICABLE MODEL	DESCRIPTION	JIG NO.
LD-707 series	L-shaped eccentric driver (for Grating & Pickup angle adj.) 	GGV-129
LD-V3000	I-shaped eccentric driver (for Grating adj.) 	GGV-134
CLD-909, CLD-1010, CLD-1050	L-shaped eccentric driver (for Grating adj.) 	GGV-129
	Pickup angle adj. wrench 	GGF-064
	J-shaped eccentric driver (for CD motor TILT adj.) 	GGF-063

The Frequencies and Levels
for
Focus & Tracking Servo Gain Adjustments

As of Apr. 1, 1989

/			PR-7820 PR-8020	VP-1000	LD-1100 LD-660 LD-V1000 PR-8210 PR-8210-A	LD-700 LD-V4000 LD-V6000 LD-V6000(BK) LD-V6010(BK) LD-V6200(BK) LD-V6000A LD-V6010A LD-V6200A LD-V6100	LD-707 LD-717 LD-838D LD-V3000 LD-V2000 LD-V4200 LD-V4100	CLD-900 CLD-909 CLD-901 CLD-1010 CLD-1050 LD-S1
TEST DISC	FRAME #	TRKG FOCS	2.0V 2.0V	7.0V 0.6V	7.0V 0.6V	4.0V 1.2V	4.0V 1.2V	4.0V 1.2V
A2	#20,000	(TRKG) (FOCS)	3.0KHz 1.7KHz	4.2KHz 2.7KHz	4.2KHz 2.7KHz	3.5KHz 2.0KHz	3.5KHz 2.0KHz	3.5KHz 2.0KHz
B1	#20,000	(TRKG) (FOCS)	3.6KHz 1.6KHz	4.8KHz 2.4KHz	4.8KHz 2.4KHz	4.0KHz 1.8KHz	4.0KHz 1.8KHz	4.0KHz 1.8KHz
F1	#18,000	(TRKG) (FOCS)	3.0KHz 1.7KHz	4.4KHz 2.8KHz	4.4KHz 2.8KHz	---	---	---
	#15,000	(TRKG) (FOCS)	---	---	---	3.0KHz 2.1KHz	3.0KHz 2.1KHz	3.0KHz 2.1KHz
F2	#18,000	(TRKG) (FOCS)	3.4KHz 1.4KHz	5.2KHz 2.1KHz	5.2KHz 2.1KHz	---	---	---
	#15,000	(TRKG) (FOCS)	---	---	---	3.7KHz 1.6KHz	3.7KHz 1.6KHz	3.7KHz 1.6KHz
F4	#18,000	(TRKG) (FOCS)	3.2KHz 1.7KHz	4.9KHz 2.7KHz	4.9KHz 2.7KHz	---	---	---
	#15,000	(TRKG) (FOCS)	---	---	---	3.3KHz 2.0KHz	3.3KHz 2.0KHz	3.3KHz 2.0KHz
F5	#18,000	(TRKG) (FOCS)	3.1KHz 1.6KHz	4.6KHz 2.5KHz	4.6KHz 2.5KHz	---	---	---
	#15,000	(TRKG) (FOCS)	---	---	---	3.3KHz 1.7KHz	3.3KHz 1.7KHz	3.3KHz 1.7KHz
N1	#20,000	(TRKG) (FOCS)	(Not available)	4.7KHz 2.2KHz	4.7KHz 2.2KHz	---	---	---
	#16,000	(TRKG) (FOCS)	---	---	---	2.7KHz 1.5KHz	2.7KHz 1.5KHz	2.7KHz 1.5KHz
N2	#20,000	(TRKG) (FOCS)	(Not available)	4.7KHz 2.1KHz	4.7KHz 2.1KHz	---	---	---
	#16,000	(TRKG) (FOCS)	---	---	---	3.1KHz 1.5KHz	3.1KHz 1.5KHz	3.1KHz 1.5KHz
GGV1001	#16,000	(TRKG) (FOCS)	---	---	---	3.7KHz 1.5KHz	3.7KHz 1.5KHz	3.7KHz 1.5KHz

NOTE:

- 1) After Grating adjustment is completed, Tracking Servo gain and Focus Servo gain should be adjusted at the frames shown in the table.
- 2) Track pitches of test discs A2 & B1 are constant or 1.67 μ m. But those of the other test discs vary with frame numbers as follows:

N1, N2		(#1)	(#500)	(#900)	(#5975)	(#15200)	(#17075)	(#52000)	(#54000)	
GGV1001	→									
F1 - F5	→	#1	#500	#900	#5975	#14500	#16000	#48200	#50400	
		1.52	1.52	1.35	1.71	1.67	1.35	1.67	1.83	1.83(μ m)

- 3) In each model, oscillator's output level should be equal irrespective of test discs. The oscillator's output levels shown in the table are suitable for the adjustment with an FTG adjuster. When adjusting the gains by observing Lissajous figures, use the same output levels except the following:

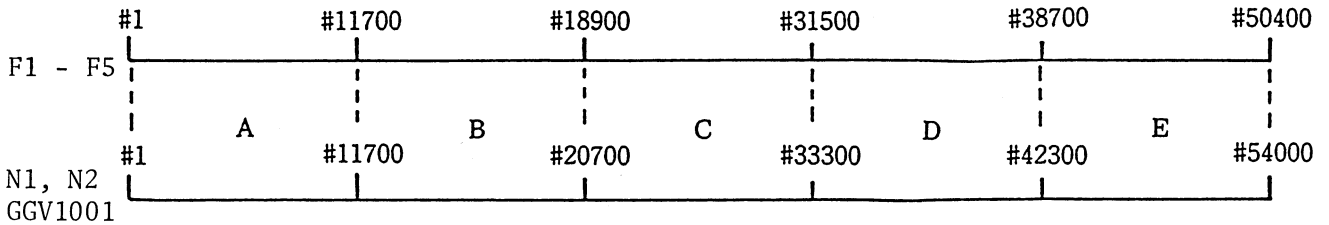
VP-1000	TRKG (20V)
PR-8210/PR-8210-A/LD-V1000	TRKG (10V)
LD-1100/LD-660	TRKG (15V)

- 4) To prevent Focus protection circuit from being activated during Focus gain adjustment, release the protection as follows:

- *LD-707, LD-V3000 --- Disconnect a 3-pin connector of FMPB unit.
- *LD-717 --- Connect D and S terminals of Q11 (FET) on DRV B unit.
- *LD-838D, LD-V2000 --- Connect D and S terminals of Q7 (FET) on DRV B unit.
- *CLD-909, CLD-1010 --- Connect D and S terminals of Q5 (FET) on SRV B unit.
- *LD-S1 --- Connect D and S terminals of Q44 (FET) on SRV B unit.

After Focus gain adjustment, make the protection circuit activated.

5) F-series test discs have some non-numbered frames for 10-minute TV/cinema conversion (*1). Therefore, at the same position of a test disc, the frame number on an N-series test disc or GGV1001 is different from that on an F-series test disc.



[F to N, N to F conversion system]

	F1 - F5 → N1 & N2 GGV1001	N1 & N2 → F1 - F5 GGV1001
A	$N = F$	$F = N$
B	$N = F \times 1.25 - 2925$	$F = N \times 0.8 + 2340$
C	$N = F + 1800$	$F = N - 1800$
D	$N = F \times 1.25 - 6075$	$F = N \times 0.8 + 4860$
E	$N = F + 3600$	$F = N - 3600$

(*1) TV/cinema conversion

Cinema film consists of 24 frames per one second, but video signal recorded on an LD disc (NTSC system) consists of 30 frames per one second. To convert Cinema film to video signal for TV, additional 6 repeat frames per one second are required. This addition is called TV/cinema conversion. In an LD disc, these 3,600 repeat frames have no frame numbers.

Service manual list

SERVICE MANUAL LIST

MAIN MODEL	MODEL NAME	SERVICE MANUAL	SYSTEM	
LD-1100	LD-1100/KU	VRT-003	With Circuits descriptions	NTSC
	LD-1100/KU	VRT-004	Additional (Ser. 3611501-)	NTSC
	LD-1100/S/G	VRT-013		NTSC
	LD-1100/HBO	VRT-008		PAL
	LD-1100/HBO/HPO	VRT-012	Additional	PAL
LD-1100	LD-1100/HB	VRT-019	Circuits descriptions	PAL
	LD-1100	VRT-016	Troubleshooting guide	
	LD-660/KU	VRT-005	With Circuits descriptions	NTSC
	LD-660/S/G	VRT-014		NTSC
	LD-V1000/KU	VRT-018		NTSC
LD-1100	LD-V1000/KU	VRT-027	Circuits descriptions	NTSC
	PR-8210/KU	VRT-006		NTSC
	PR-8210/KU	VRT-010	Additional	NTSC
	PR-8210-A/KU	VRT-019	With Circuits descriptions	NTSC
	LD-700	LD-700/KU	VRT-021	
LD-700/KUW4 (KU/BK)		VRT-037	Additional	NTSC
LD-700/S/G		VRT-032	Additional	NTSC
LD-700/S/G (BK)		VRT-056	Additional	NTSC
LD-700/K/TW		VRT-036	Additional	NTSC
LD-700		VRT-035	Circuits descriptions	NTSC
LD-700/HEM, HB, S/G		VRT-040		PAL
LD-700/HEM, HB (BK)		VRT-058	Additional	PAL
LD-700		VRT-041	Circuits descriptions	PAL
LD-700		GGF-605	Repair guide	
LD-V4000/KU/KC		VRT-026		NTSC
LD-V4000/HEM, HB		VRT-044		PAL
LD-700		LD-V6000/KU	VRT-028	
	LD-V6000/KC	VRT-045	Additional	NTSC
	LD-V6000/KU, KC	VRT-039	Circuits descriptions	NTSC
	LD-V6000/KU, KC	VRT-038	Quick repair guide	NTSC
	LD-V6000/KU, KC	VRT-046	RS-232C descriptions	NTSC
LD-700	LD-V6000 (BK)/KU, KC	ARP1160		NTSC
	LD-V6010 (BK)/KU, KC	ARP1160		NTSC
	LD-V6200 (BK)/KU, KC	ARP1160		NTSC
LD-700	LD-V6000A/KUC	ARP1279	With Circuits descriptions	NTSC
	LD-V6010A/KUC	ARP1304	Additional	NTSC
	LD-V6200A/KUC	ARP1402	Additional	NTSC
	LD-V6100/HGM	ARP-958		PAL

SERVICE MANUAL LIST

MAIN MODEL	MODEL NAME	SERVICE MANUAL	SYSTEM
CLD-900	CLD-900/KU	VRT-050	NTSC
	CLD-900/KU	VRT-054 Additional (Ser. 3603001 -)	NTSC
	CLD-900/S/G	VRT-055 Additional	NTSC
	CLD-900	VRT-051 Circuits descriptions	NTSC
LD-707	LD-707/S/G	VRT-057	NTSC
	LD-707/S/G	VRT-060 Circuits descriptions	NTSC
	LD-717/S/G	ARP1217	NTSC
	LD-838D/KU	ARP1282	NTSC
	LD-838D/S/G	ARP1327 Additional	NTSC
	LD-V3000/KUC	ARP1192	NTSC
	LD-V2000/KUC	ARP1283	NTSC
CLD-909	LD-V4200/KUC	ARP1260	NTSC
	LD-V4100/HGM	ARP1548	PAL
	CLD-909/KU, KC, S/G	ARP1191 With Circuits descriptions	NTSC
	CLD-901/S	ARP1259 Additional	NTSC
LD-S1	CLD-1010/KUC, S/G	ARP1373	NTSC
	CLD-1050/HEM	ARP1469	PAL
CLD-3030	LD-S1/KU, KC	ARP1420	NTSC
	LD-S1/KU, KC	ARP1446 Circuits descriptions	NTSC
	CLD-3030/KU/CA	ARP1559	NTSC
	CLD-3030	ARP1560 Circuits descriptions	NTSC
	CLD-3030/SD/G, S/G	ARP1637 Additional	NTSC
	LD-W1/KU/CA	ARP1590	NTSC
	CLD-1030/KUC	ARP1502	NTSC
LK-V350/KU/CA	ARP1508	NTSC	

Main IC list in LD-700 & 707 series

MAIN IC LIST
FOR LD-700 SERIES

	LD-700 (NTSC)	LD-700 (PAL)	LD-V4000 (NTSC)	LD-V4000 (PAL)	LD-V6000 (NTSC)	CLD-900 (NTSC)
Pickup	VWY-059	VWY-059	VWY-059	VWY-059	VWY-059 (VWY-084)	VWY-073
FTS SERVO	PM4001	PM4001	PM4001	PM4001	PM4001	PM4001
Video Demo	SN76670N	SN76670N	SN76670N	SN76670N	SN76670N	SN76670N
DOS	PA3018	PA3018	PA3018	PA3018	PA3018	PA3018
1H Delay	MN8036	MN8033	MN8036	MN8033	MN8036	MN8036
CPC, Video Process	PA9003	PA9003	PA9003	PA9003	PA9003	PA9003
Sync Sep	PA0009	PA0009	PA0009	PA0009	PA0009	PA0009
Sync Gate, CPC	PA9001	PA9001	PA9001	PA9001	PA9001	PA9001
TANG SERVO	PA9002	PA9002	PA9002	PA9002	PA9002	PA9002
SPDL SERVO	UM3002A	UM3002A	UM3002A	UM3002A	UM3002A	UM3002A
Audio Demo	PA3001A (2 pcs.)	UPC1391H (2 pcs.)	PA3001A (2 pcs.)	UPC1391H (2 pcs.)	PA3001A (2 pcs.)	PA3001A (2 pcs.)
CX NR	HA12043	HA12043	HA12043	HA12043	HA12043	HA12043
CPU	PD3021	PD3021	PD3029	PD3029	LH0080A	HD6305X2P
SUB CPU	PD4034	PD4034	PD8008	PD8008	PD8011	PD4034, UPD8255AC-5
	PD0010	PD0010	PD0010	PD0010	PD0010	PD0010
	PD0011	PD0011	PD0011	PD0011	PD0011	PD0011
EP ROM	-----	-----	-----	-----	-----	VYW-061
SPDL DRIVE	PA2016	PA2016	PA2016	PA2016	PA2016	PA2016

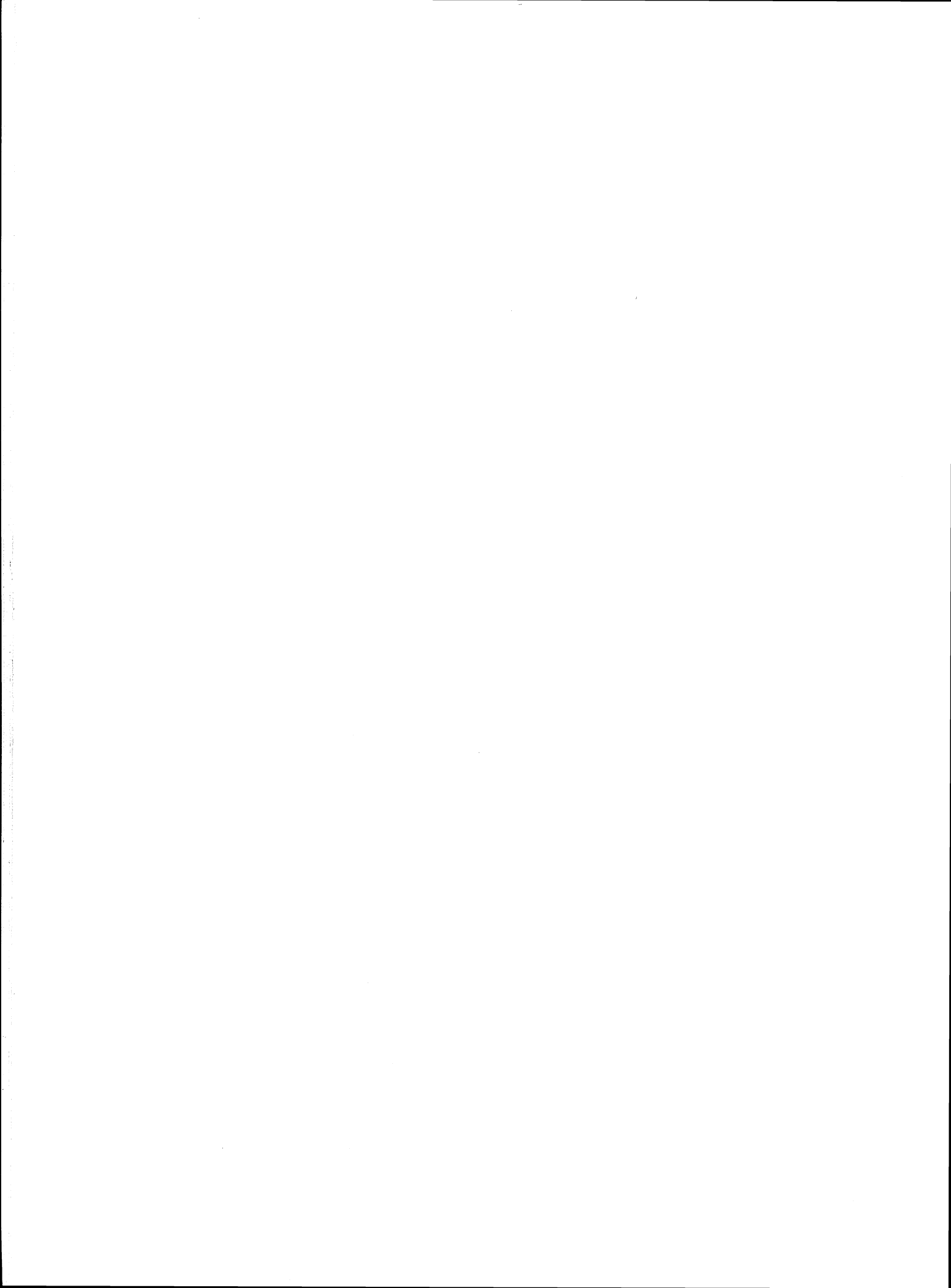
MAIN IC LIST FOR LD-707 SERIES

	LD-707	LD-V3000	LD-717	LD-V2000	LD-V4200	LD-838D
Pickup	VWY-097	VWY-098	VWY-100	VWY1003	VWY1005	VWY1008
FTS SERVO	PM4001	PM4001	PM4001	PM4001	PM4001	PM4001
Video Demo	SN76670N	SN76670N	PA0023	PA0023	PA0023	PA0023
DOS	PA3018	PA3018	PA3018	PA3018	PA3018	PA3018
1H Delay	MN8036	MN8036	PM0001	PM0001	PM0001	PM0001
CCD (Audio/Video)	TL8614P (A/V)	CXL1004P (A/V)	TL8614P (A)	TL8707P (A)	TL8614P (A/V)	TL8707P (A)
CCD Clock	PA0017	PA0017	PA0017	PA0017	PA0017	PA0017
CPC, Video Process	PA9003	PA9003	PA9003	PA9003	PA9003	PA9003
Sync Sep	PA0009	PA0009	PA0009	PA0009	PA0009	PA0009
PB H Gen	PA0018	PA0018	PA0018	PA0018	PA0018	PA0018
SPDL SERVO	PM2001	PM2001	PM2001	PM2001	PM2001	PM2001
CCD ERROR	PA5009	PA5009	PA5009	PA5009	PA5009	PA5009
VNRB(Hybrid)	---	VYY-008	---	---	DYY1001	---
SPDL DRIVE	PA2016	PA2016	PA2016	PA2016	PA2016	PA2016
Audio Demo	PA3020	PA3020	PA3020	PA3020	PA3020	PA0026
CX NR	HA12043	HA12043	HA12043	HA12043	HA12043	---
Blue Back	---	---	---	---	---	---
CPU	PD3060 (3049,3054)	HD6305X2P	PD3067	PD3096	PD5050	PD3082
Remote Control Dec	PD5029	PD5029	PD5029	PD5029	---	PD5029
	PD0010	PD0010	PD0024	PD0024	MB89011P-102	PD0024
	PD0011	PD0011	---	---	PD0011	---
EP ROM	---	VYW-085	---	---	---	---
RAM	---	HM6116P-4	---	---	---	---
	---	TMP82C55AP-5	---	---	---	---

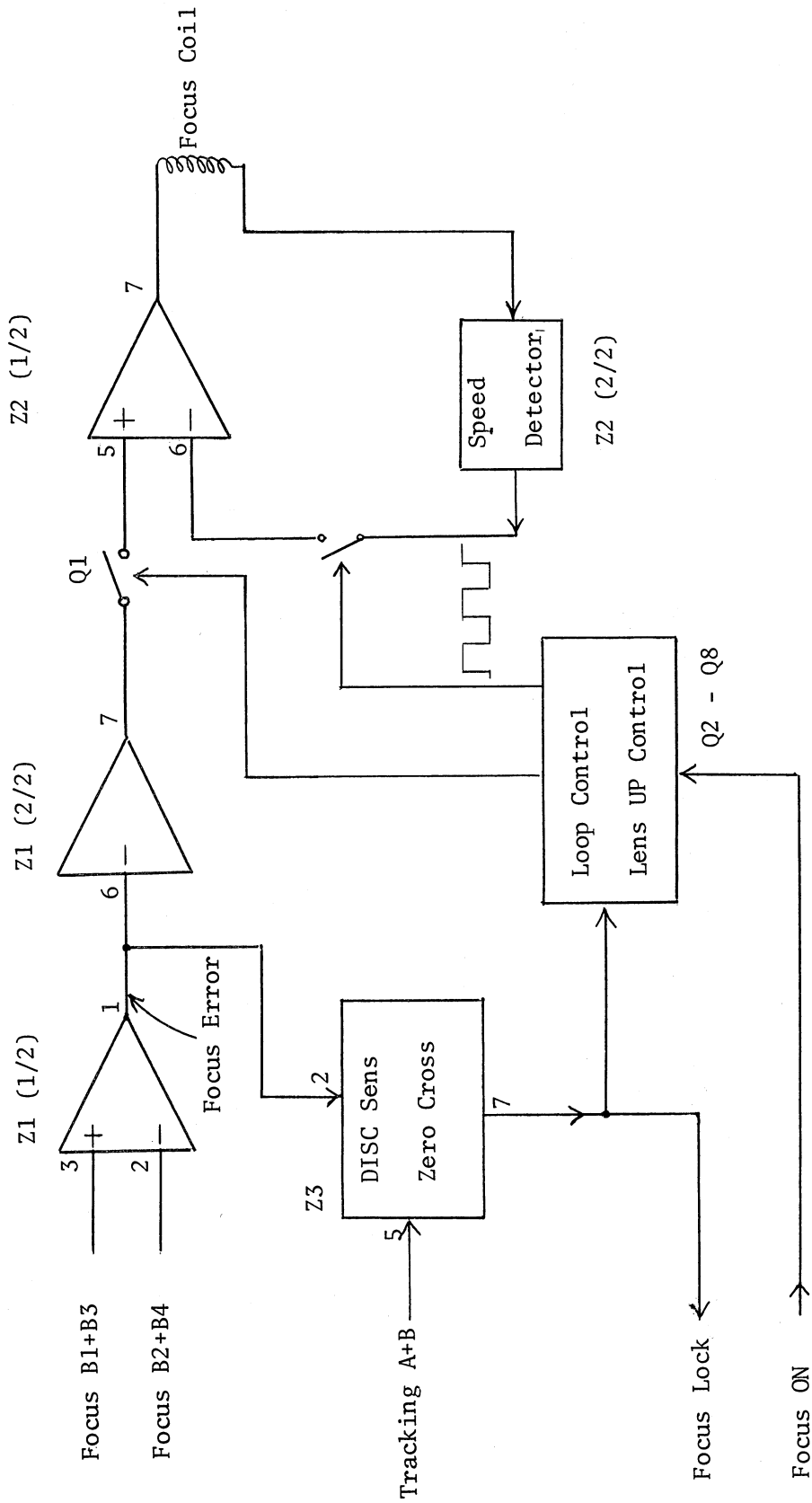
MAIN IC LIST FOR LD-707 SERIES

	CLD-909	CLD-1010	CLD-1050	
Pickup	VWY-097	VWY1010	VWY1010	
FTS SERVO	PM4001	PM4001	PM4001	
Video Demo	UA5002A	PA0023	PA0023	
DOS	PA3018	PA3018	PA3018	
1H Delay	PM0001	PM0001	PM0001	
CCD (Audio/Video)	TL8614P (A/V)	TL8707P (A)	CXL1004P-1 (A)	
CCD Clock	PA0017	PA0017	PA0017	
CPC, Video Process	PA9003	PA9003	PA9003	
Sync Sep	PA0009	PA0009	PA0009	
PB H Gen	PA0018	PA0018	PA0018	
SPDL SERVO	PM2001	PM2001	PM2001	
CCD ERROR	PA5009	PA5009	PA5009	
VNRB(Hybrid)	---	---	---	
SPDL DRIVE	PA2016	PA2016	PA2016	
Audio Demo	PA3020	PA0026	PA0026	
CX NR	HA12043	---	---	
Blue Back	MN6064R	---	---	
CPU	HD6305Y2P	HD6305Y2P	HD6305Y2P	
Remote Control Dec	PD5029	PD5029	PD5029	*Blue back is not used.
	PD0010	PD0024	PD0024*	
	PD0011	---	---	
EP ROM	VYW1012 (VYW1004)	VYW1034	VYW1150	
RAM	---	---	---	
	M5L8255AP-5 (2 pcs.)	M5L8255AP (2 pcs.)	M5L8255AP (2 pcs.)	

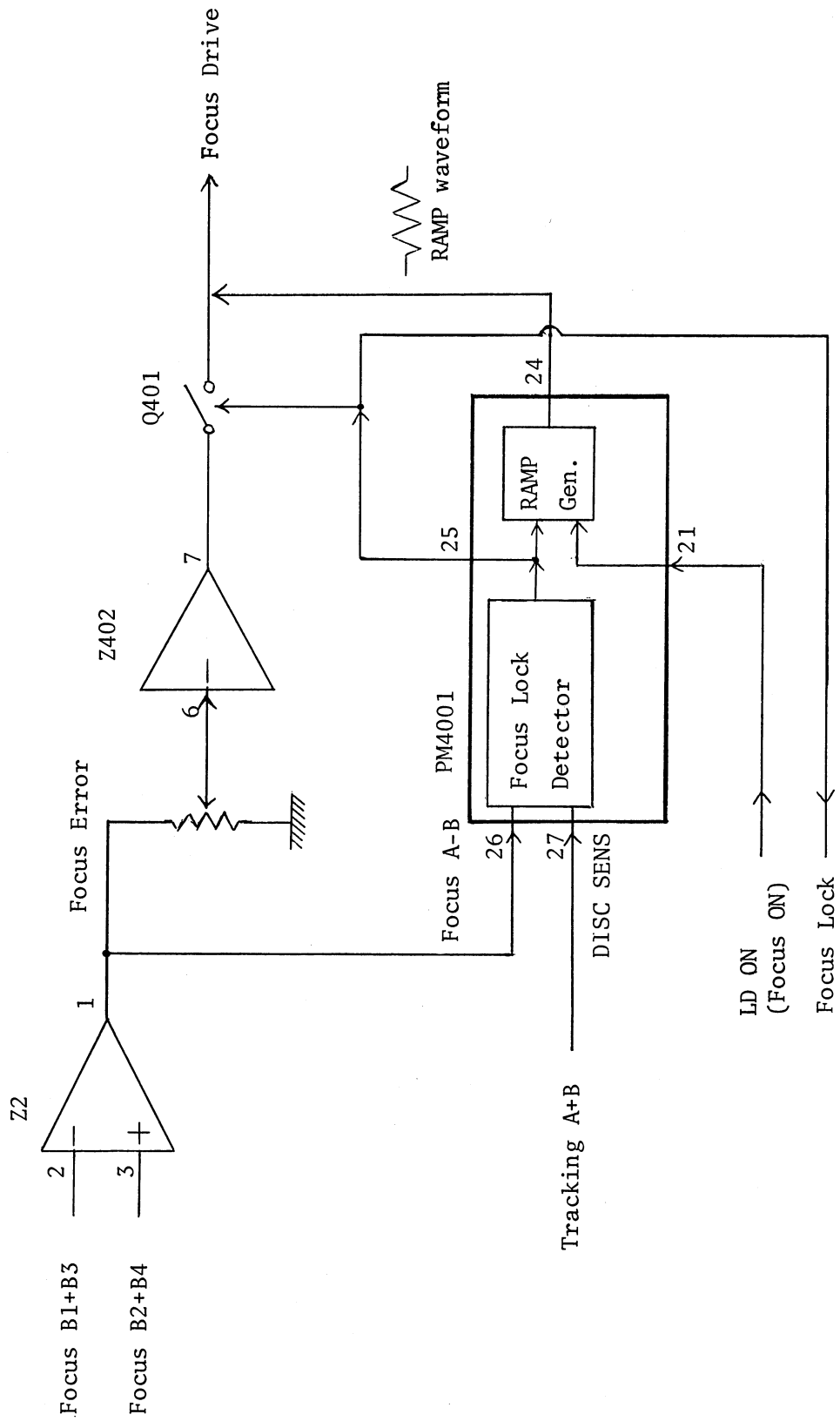
Block diagrams for SERVO loop circuits



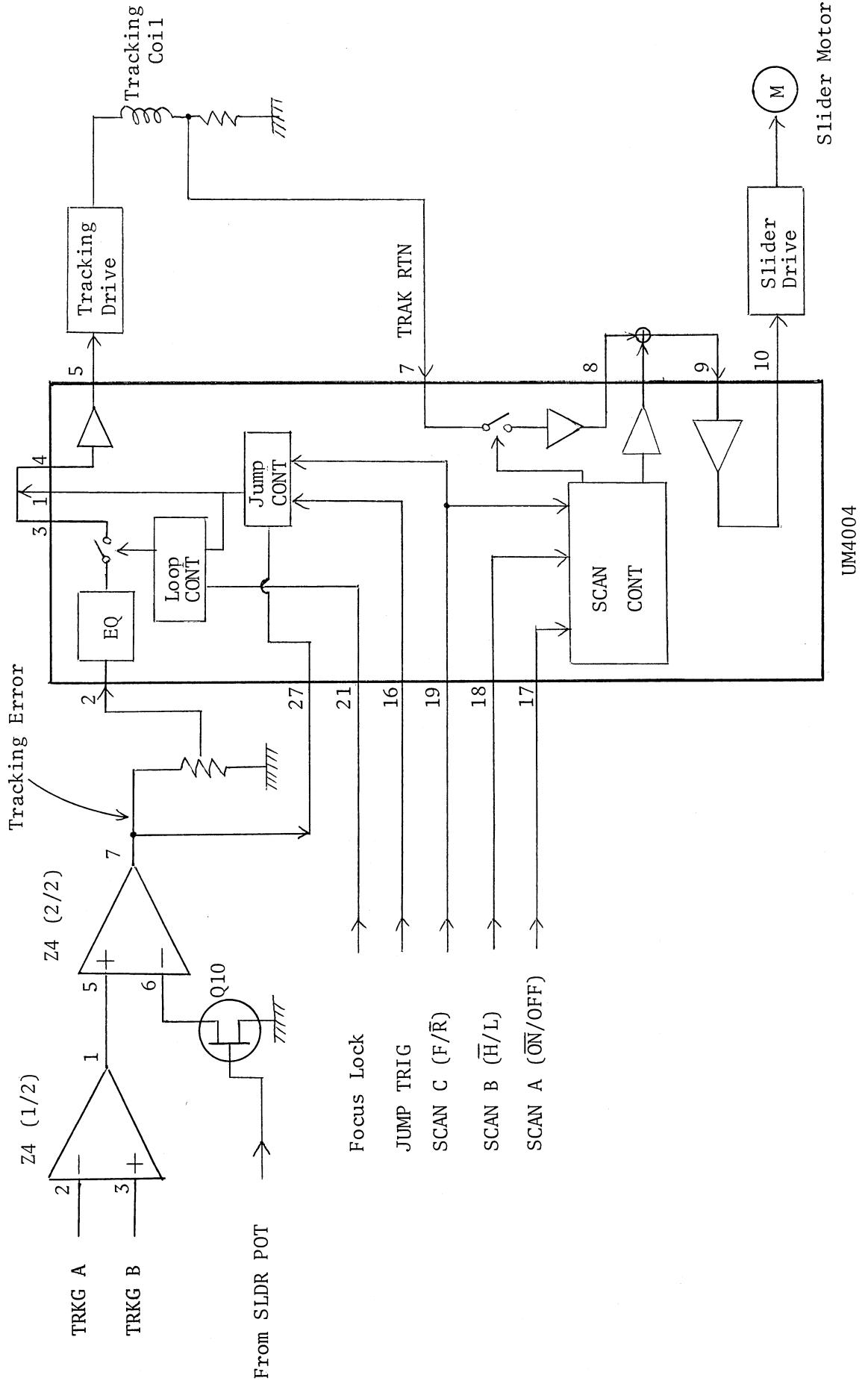
LD-1100 FOCUS SERVO



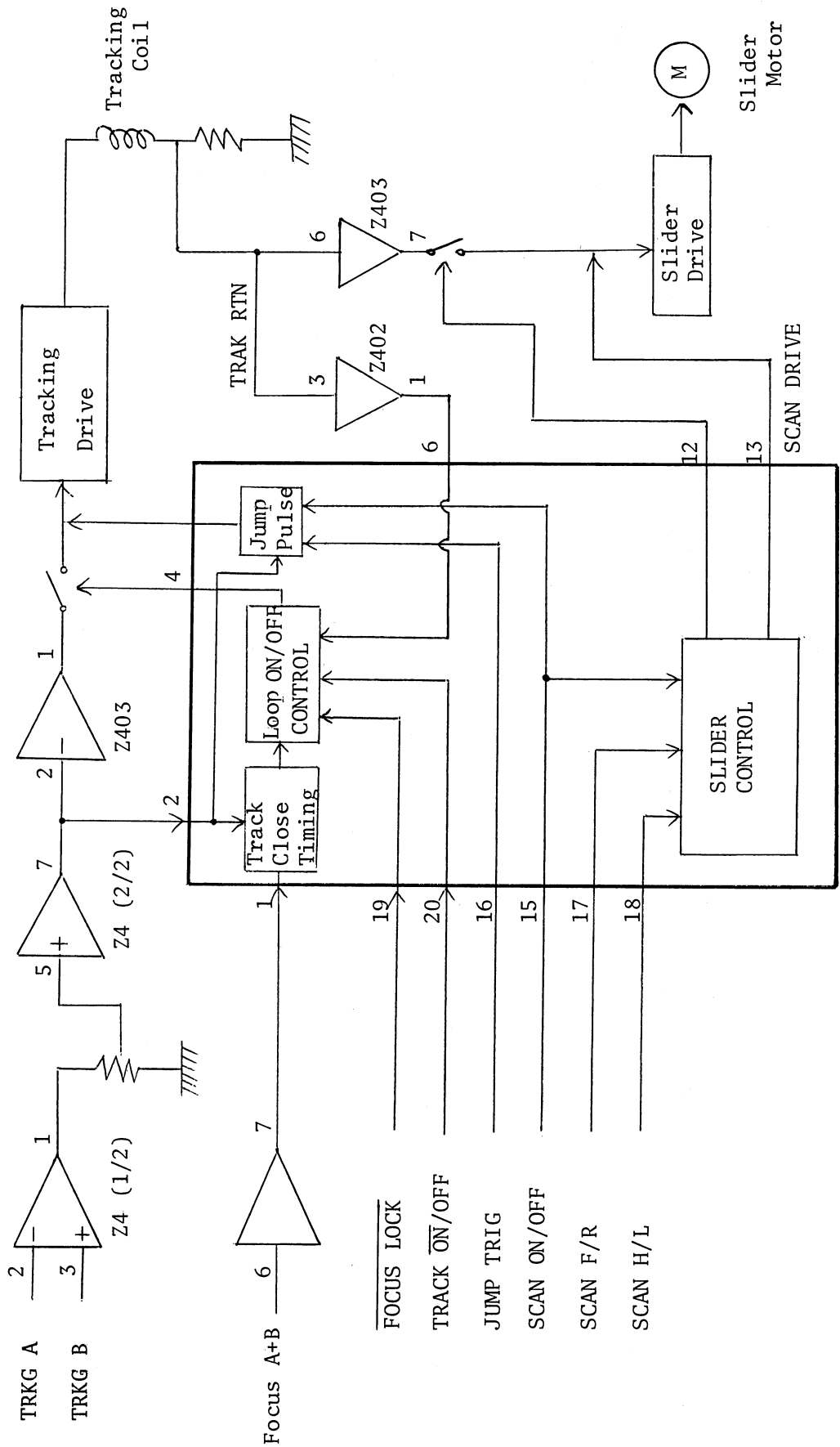
LD-700 FOCUS SERVO



LD-1100 TRACKING & SLIDER SERVO

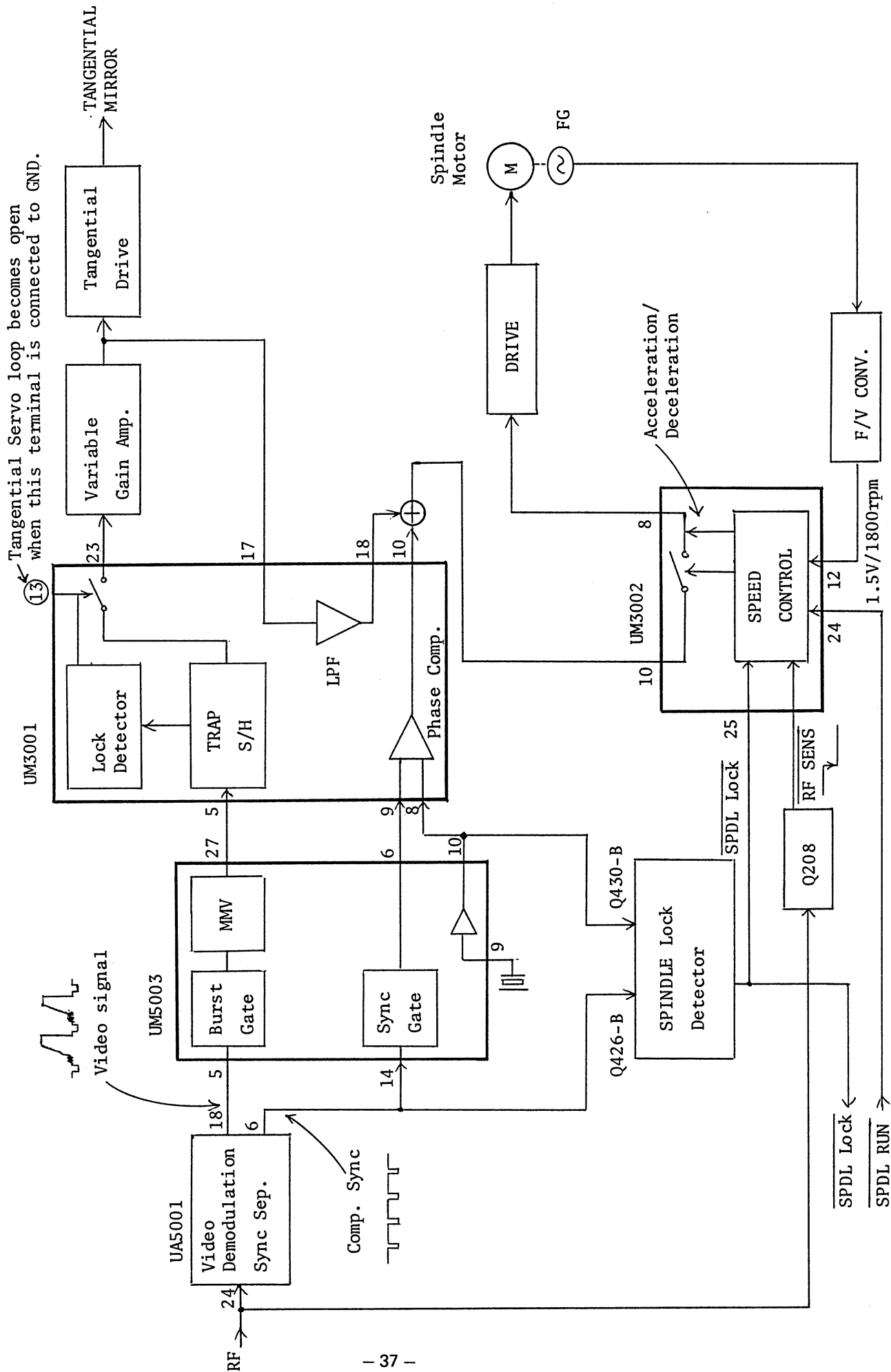


LD-700 TRACKING & SLIDER SERVO

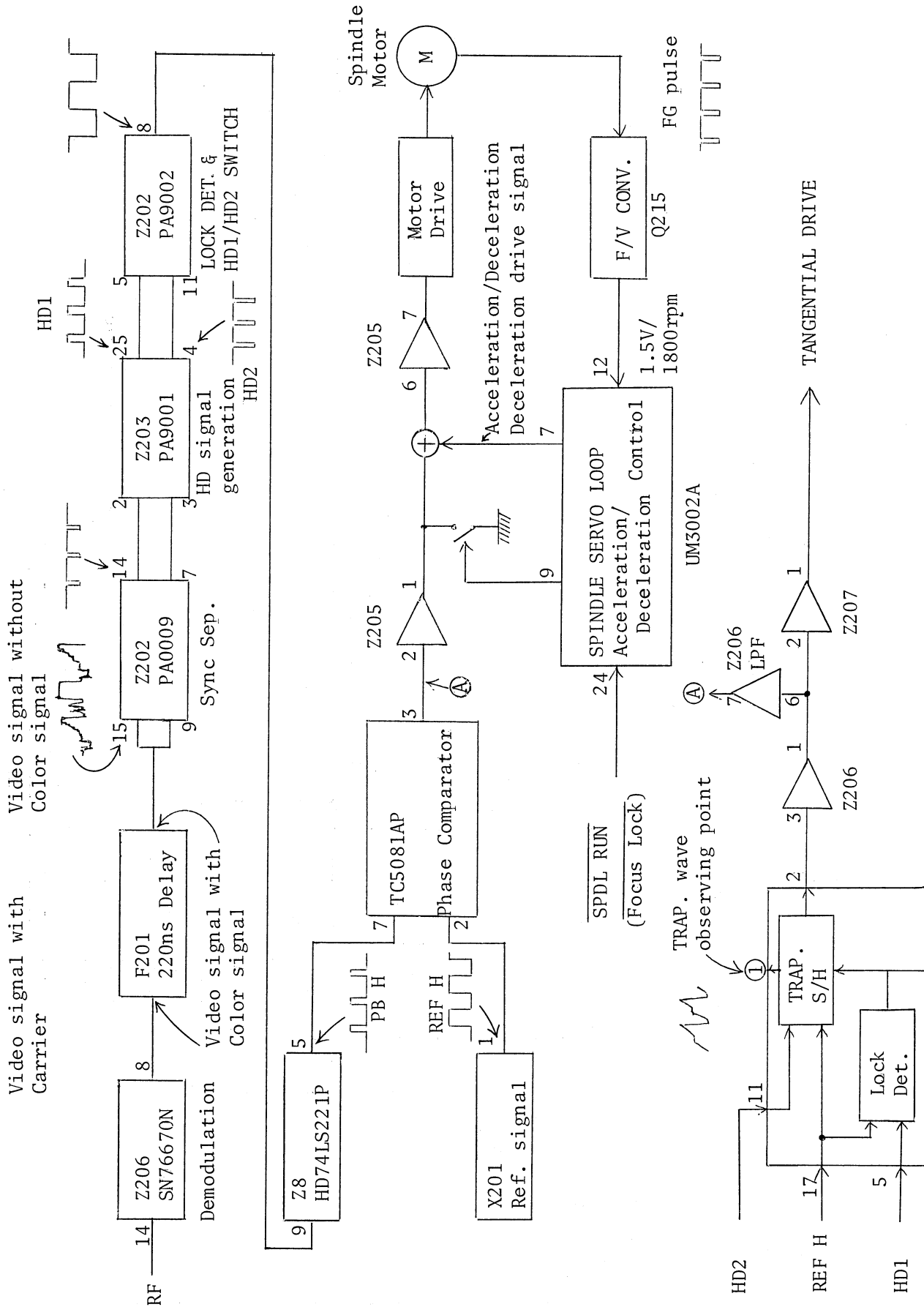


PM4001

LD-1100 SPINDLE & TANGENTIAL SERVO

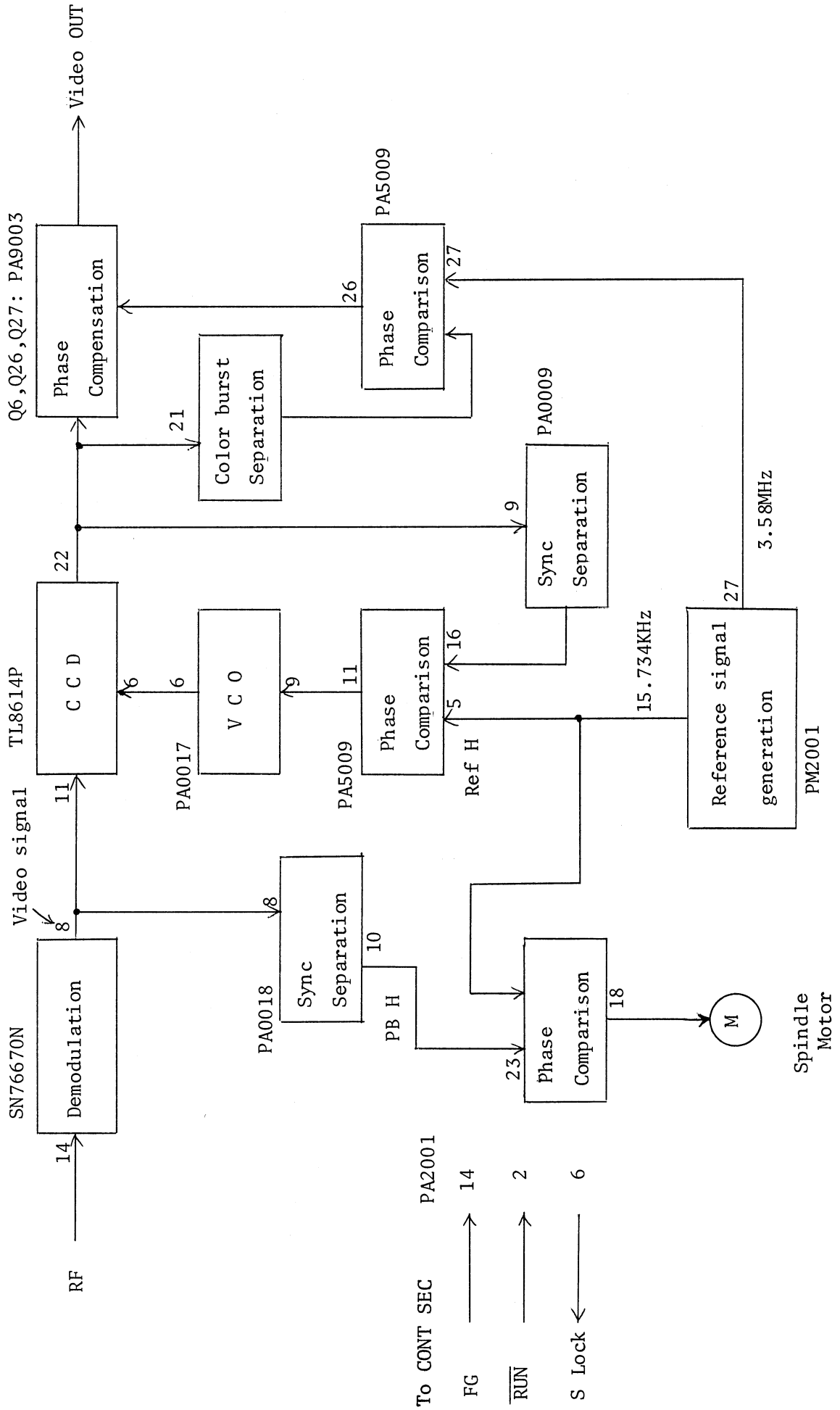


LD-700 SPINDLE & TANGENTIAL SERVO

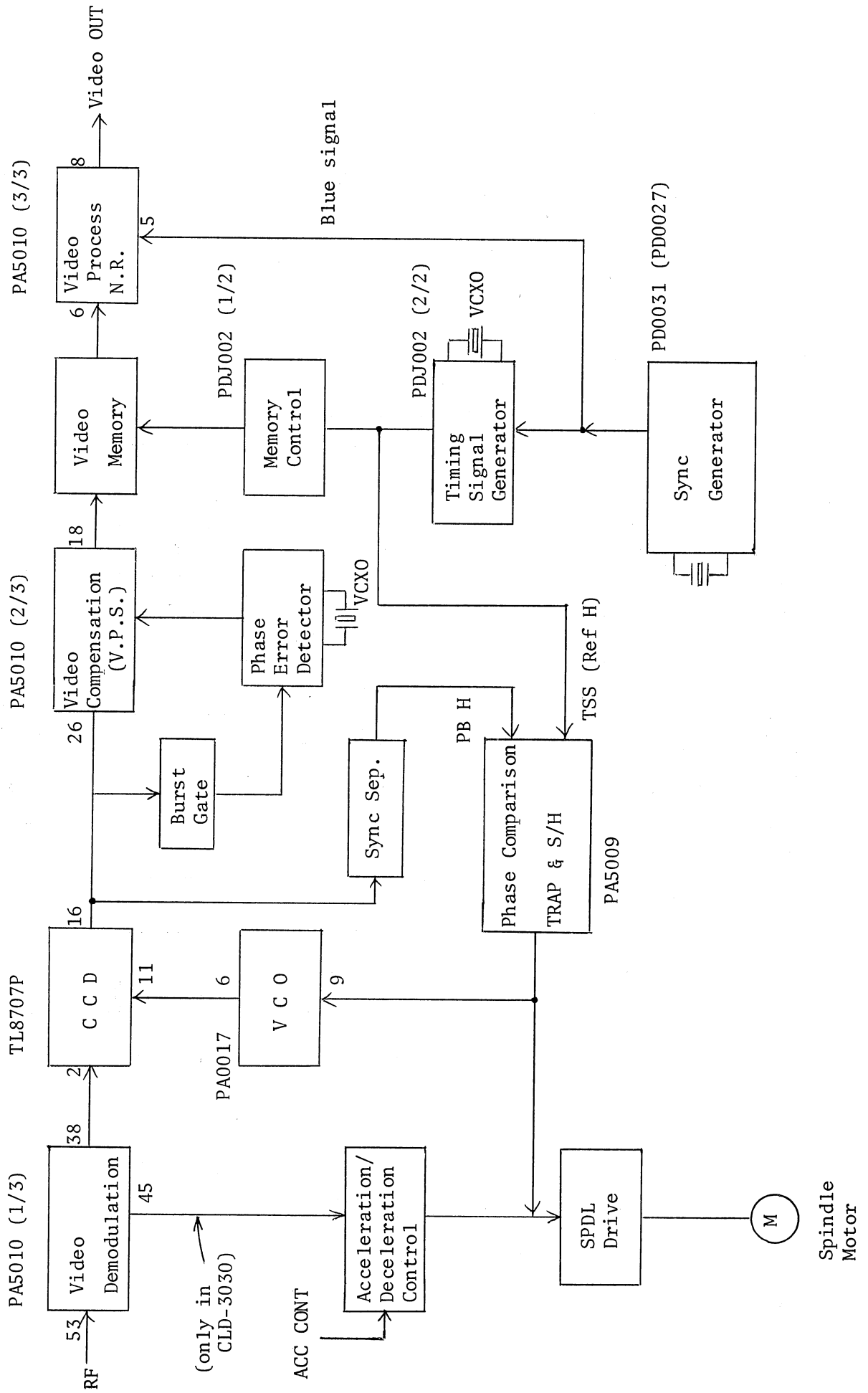


Tangential Servo loop becomes open when this terminal is connected to GND

LD-707 SPINDLE SERVO


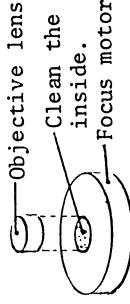



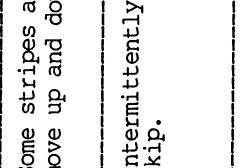
CLD-3030 SPINDLE SERVO (LD-S1 is basically the same.)

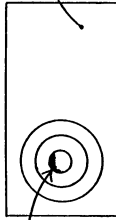

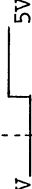




Troubleshooting





Problem	Countermeasure	S/M: VRT-003	Cause	Remarks
Laser doesn't light up.	-Replace INTERLOCK SW (VSF-007).	P.114, No. 31	LSPS circuit doesn't work due to poor contact of the INTERLOCK SW.	[Check method for LSPS] -Turn on the INTERLOCK SW on the rear panel and connect TP12 on LSPS to GND. Then Laser will light up. -When Laser starts lighting up, the waveforms at Q6 & Q7's collector are:
	-Replace Q10 (2SD818) & R10 on LSPS.	P.74, C-2	High voltage generator circuit failure	 <p>8Vp-p</p> <p>- While Laser is lighting, DC voltage of 300V or more is generated between each positive terminal of C1 - C6 and GND.</p>
After some-time play, play doesn't function. (or laser doesn't light up.)	-Replace Slider ass'y.	P.113, No. 7	Laser tube's thermal characteristics is poor.	
When Play key is depressed, Objective lens doesn't go up and down.	-Remove the objective lens from Focus motor and clean the inside of Focus motor hole. 	P.118, No. 25	The objective lens is stuck.	[Check points] 1. FOCUS ON signal is shifted to Low. (Lid Sw) 2. Bridge Balance adjustment 3. Focus Drive circuit
Intermittently Spindle is not locked.	-Glue FG magnet again.	P.110, No. 44	SPDL motor FG magnet is loose. FG is used for SPDL motor acceleration & speed control.	FG output adjustment (VR407) should be made after FG magnet is glued.
Out of sync during Play SPDL servo is not locked. (Rotation is almost normal.)	-Replace D205 in RF SENSE circuit of VDEM.	p.84, D-10	RF sense signal is included in SPDL servo control signal. If RF sense circuit is defective, SPDL servo can't be locked.	[SPDL-motor-rotation check method] -Depress PLAY key. When SPDL motor rotation is stable (around 1800rpm), short N9-2 & GND to release video squelch. When a picture appears, rotation is normal. -If for an instant a picture appears by braking disc rotation manually, rotation is too high. (In LD-660, Video squelch is released by depressing SCAN key.)

Problem	Countermeasure	S/M: VRF-003	Cause	Remarks
Intermittently pictures become colorless.	-Replace SPDL motor.	P.110, No. 44	SPDL motor brush is deteriorated.	[Check method for motor brush] When there are spike noises on SPDL Return signal, the brush is deteriorated. (When an 8-inch disc is played, the problem may disappear for some time.)
Some stripes appear and move up and down.	-Change C218 & C229 on VDEM. C218: 47/16 → 220/16 C229: 0.01 → 47/16	P.84, B-10 C-10	Power supply voltage change affects Video demodulation IC.	
Intermittently pictures skip.	-Replace SLIDER motor with VXM-010 and make circuit change on VSOP. R92: 30k ohms → 51k ohms R98: 22k ohms → 43k ohms	P.5-6, C-4 D-5	SLIDER motor is stuck, which will cause track skipping.	
Uncontrollable SPDL motor speed in SCAN or SEARCH mode	-Replace DL-201 (1H delay line) on VDEM.	P.83, C-9	Delay line failure (Delay line output is 1.0mVp-p or less.)	[Delay line check method] -Observe 1H delay signal at Pin-16 of UA5001. If there are pulsative noises, 1H delay line is defective. 
Intermittently sound becomes low or none (at both channels).	-Resolder R103 on AUDX.	P. 93, B-5	Poor soldering of R103. CX NR gain control input signal is NG.	[Check method for Audio circuit] -Check CX NR circuit & power supply when audio signal is NG at both channels. * In CX NR circuit, even with CX OFF, audio signal is applied, so gain control voltage should be constant. * Gain control input is observed at Pin-1 & Pin 16 of Z7.
Crosstalk with a CLV disc (many red stripes)	-Perform Photo diode adjustment with PD chopper. -Adjust the position of the P.C. board fixing Objective lens ass'y (VGX-025). (See SI-V36002).	P.117, No. 56	The length of FOCUS coil cord affects FOCUS servo. 	[FOCUS-COIL-BOARD POSITIONING METHOD] -If crosstalk flows from right to left at the top, fix the P.C. Board so that the FOCUS coil is stretched. -If crosstalk flows from left to right at the top, fix the P.C. Board so that the coil is loosened. -If there are many red stripes, observe TRKG error signal in STILL mode. Adjust P.C. Board position so that the amplitude becomes minimum. (See Fig.)

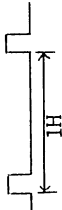
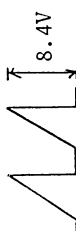
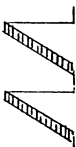

Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
No play (Laser diode doesn't light, but Lens moves up and down.)	-Replace Q16 on DRV.B.	P. 30, D-4	The voltage for APC Vcc (+11V) isn't be supplied.	-Verify whether or not Laser diode lights up by visual check. Lights in red.  Pickup
No play (Play key is rejected.)	-Replace Slider motor.	P.76, No. 5	Pickup doesn't move to Inside position.	[Slider-drive-circuit check method] -Turn off the power. -Move the pickup to outer tracks and turn on the power. -Confirm that the following signals are put out at Z401 (PM4001). *Pin 15 (SCAN F/R) --- 0V *Pin 17 (SCAN ON/OFF) --- 5V *Pin 18 (SCAN H/L) --- 0V *Pin 13 (Output) --- -3.5V (The output at Pin 13 is used to move pickup to Inside position.)
	-Replace Z401 (PM4001) on SRVB.	P.41		
	-Replace Relay (VSR-007) on FLYB. (Only in LD-V6000)	VRT-028 P.35, C-2	The current doesn't flow into Slider motor, FOCS coil and TRCK coil.	[Relay check method] If Pickup can easily be moved manually when Power is turned off, the relay (VSR-007) is defective. *(In LD-V6000, when Power is turned off, the relay makes the terminals of Slider motor shorted to keep the motor locked.)
No play (SPDL motor rotates but stops immediately.)	-Replace D2 (HZ3C2) on SRVB. -Replace Fuse holders for FU5 & FU4 on SFUS.	P.38, A-4 P.29, C-2	Poor contact of Fuse holders RESET voltage (+11V) is low. Reset is activated in CPU when motor starts rotating and the power supply line is loaded.	[CPU RESET signal check method] -Observing the signals at Z2 Pin-26 & Pin-4, turn on power. Power ON Pin-26 (VDD) 0V  5V Pin 4 (RESET) 0V  5V When the RESET signal (Pin-4, Z2) is low, RESET is activated in CPU.

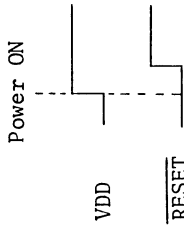
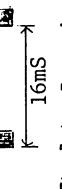
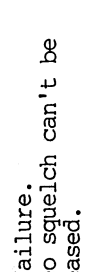
Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
Intermittently SPDL motor doesn't rotate. The rotation is not accelerated to 1800rpm. No eject	-Replace Mech chassis ass'y.	P.76, No.68	Drive transistor is shorted on BLMB. As SPDL STOP signal is not shifted to H, Eject can't be accepted. (SPDL DRIVE IC, PA2016, detects SPDL STOP when the motor rotates in reverse for an instant.)	-If a disc can start rotating manually after Play key is depressed, check SPDL motor as follows: 1) While braking disc rotation by hand, push PLAY key. 2) After FOCUS servo is locked, turn the disc slowly by hand. 3) When a dead point is found, DRIVE transistor (BLMB) may be shorted or Motor coil may be open. -If a disc doesn't rotate at all, Z3 and Z4 on DRVVB may be defective. [SPDL DRV signal -- optimum] STBY → -5V → PLAY → 
	-Replace Z3 & Z4 (NJM4558S) on DRVVB.	P.30, B-5		
SPDL motor speed is uncontrollable. The motor stops after 40-sec rotation.	-Replace Q206 & D216 on SRVB.	P.46, D-4	Rotation comparator for acceleration doesn't work, acceleration voltage is being applied to SPDL DRIVE signal.	-When Q206 and D216 are defective, the signal at Pin-19 of Z201 on SRVB is 1.4V or more.
	-Replace Z206 (SN76670N) on DEMB.	P.49, A-3	RF signal can't be converted to Video signal.	[SRVB check method] If SPDL motor repeats acceleration and deceleration, PB H and Ref H can't be compared with each other.
	-Replace F201 (220nS Delay line) on DEMB.	P.50, A-4	Video signal is not put out.	1. Verify that PB H & Ref H are applied to Pin-7 & Pin-2 of Z203 respectively.
	-Replace X201 on SRVB.	P.45, A-2	Ref H can't be extracted.	2. If pulsative signal isn't superimposed on PB H, observe the signal at Pin-26 of Z203. [Optimum waveform]
	-Replace Z203 on SRVB.	P.45, A-3	PB H & Ref H can't be compared with each other.	
	-Replace C302 and/or C301 on DEMB.	P.49, D-3	HDI signal is applied from Pin-25 of Z203 on DEMB.	
	-Replace Z202 (PA0009) on DEMB.	P.49, D-3	Composite sync can't be extracted from Video signal.	*Z202 (PA0009) extracts composite sync from Video signal. Then Z203 (PA9001) produces H sync without equalizing pulses & HDI signal.

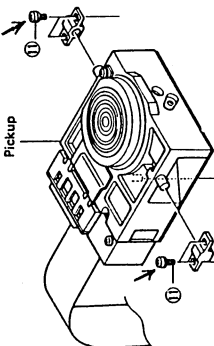
Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
<p>It takes much time to lock SPDL servo.</p> <p>SPDL can't be locked, then stops.</p> <p>SPDL servo is locked, but pictures are colorless and skip.</p>	<p>-Replace C228 on SRVB.</p>	<p>P.46, A-5</p>	<p>Servo gain increases due to capacitance decrease of C228. SPDL motor repeats acceleration and deceleration, and can't be locked.</p>	<p>[Check method] -Observe the waveform at Pin-7 of Z205 on SRVB. (OK)</p>  <p>(NG)</p>  <p>-In case of NG: Load a 12-inch disc. Short the collector of Z208 and GND to sense it as an 8-inch disc. SPDL gain will decrease and PLAY will be possible. * When SPDL servo is locked and pictures are colorless, mistakenly TANG servo failure may be sensed.</p>
<p>SPDL motor speed is uncontrollable.</p>	<p>-Replace D403 on SRVB.</p>	<p>P.42, B-5</p>	<p>D403 is shorted. (As FOCUS LOCK signal is low, SPDL servo doesn't work.)</p>	<p>*When RUN signal applied to BLMB is shifted to Low, SPDL motor rotates.</p>
<p>Around outermost tracks (#48,000 or more), SEARCH is impossible, & SPDL motor speed is uncontrollable.</p>	<p>-Replace SPDL DRIVE IC (PA2016) on BLMB.</p> <p>-Replace X2 (VSS-021) on SRVB.</p> <p>-Replace C202 and/or L203 on DEMB.</p>	<p>P.29, A-1</p> <p>P.38, B-5</p> <p>P.49, A-2</p>	<p>SPDL DRIVE IC failure</p> <p>Micro computer can't be activated.</p> <p>C202 and L203 are open. (RF signal is small. Video signal can't be demodulated & H sync can't be extracted.)</p>	<p>[Check method] - Verify that RF signal at Pin-14 of Z206 on DEMB is 600mVp-p or more. If it shows around 100mVp-p, C202 and/or L203 are defective. - When SPDL motor speed is uncontrollable in SEARCH or SCAN mode, adjust RF level to half level and depress Scan. If SPDL motor speed is kept uncontrollable, there is failure between RF signal and Video demodulator circuit (including DOS compensator). After checking, readjust RF level. - When DOS and LH Delay circuit are checked, short Pin-15 of Z201 (PA3018) and GND to prohibit Drop out compensation.</p>

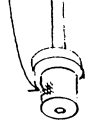
Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
On outer tracks, SPD-L stops.	-Readjust Outside limit. -Adjust SPD-L motor height. (Loose the height adj. screw & the worm screw on the front panel side. Then turn the hex nut clockwise by 90 degrees.)	P.23 --- ---	Outside limit is deviated, so play is impossible on outer tracks. Out of focus on outer tracks due to disc warp.	*In LD-707 and the oldest models, when INSIDE limit or OUTSIDE limit adjustment is deviated, Play is impossible on inner tracks or outer tracks. [Caution] -SPDL motor height adjustment should be made only when there is no other remedy. -The hex nut can be turned clockwise within 90 degrees. -Verify that an LD disc doesn't touch the tray during adjustment.
When luminance level rises quickly, pictures skip. (Unstable V sync)	-Change C279 from 4.7µ/16V to 2.2µ/16V on DEMB. -Readjust Video level.	P.49, C-2 PP.18 & 19	Sync Sep circuit misoperates due to sudden change of luminance signal. Video out. level is deviated, Sync Sep circuit in TV monitor misoperates.	[Check method] -Verify that Video level is LVP-P between Sync tip & White level. If so, TV monitor doesn't affect LD player. -If not, adjust Video level. -When sound skips at the same time when a picture skips, there is failure in the LD player.
No pictures without a white horizontal band appear. The operation stops some time after.	-Replace Pickup.	P.33, D-1	Cl03 on APGB is open. (RF signal oscillates, & its waveform is unsmooth.)	
Out of sync with a 12-inch disc.	-Replace DISC SIZE SENS LED (D1: TLR123) on LOLB. -Change R12 & R14 on LOLB from 22k ohms to 75k ohms.	P.37, B-2	-Even when a 12-inch disc is loaded, it is sensed as an 8-inch disc. SPDL servo gain is too low & TANG servo gets unlocked intermittently. -When DISC SENS is unstable, improve the sensitivity.	[Check method for DISC SENS LED] Two DISC SENS LED's should light up in red for an instant right after: -power is turned on. -The disc table is loaded.
Color horizontal bar noises on frame upper part. (more visible on color pictures)	-Replace Q12 (TANG DRIVE transistor) on DRVB. -Replace Z202 (PA9002) on SRVB.	P.30, C-5 P.45, C-2	TANG mirror doesn't work.	[TANG servo check method] -Observe TANG RTN voltage. -If the signal disappears or is clipped, DRIVE transistor on TANG servo is defective.



Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
Pictures become colorless for an instant around 9 min, 20 min & 30 min with CLV disc played. (Track skip)	-Change R227 on SRVB from 200k ohms to 750k ohms.	P. 46, B-5	When SPDL servo gain is shifted, pictures become colorless for an instant.	*The SPDL servo gain is shifted at 3 points: 9 min., 20 min. & 30 min.
Picture becomes colorless after scanning intermittently.	-Change C310 on DEMB from 0.47µ/50V to 2.2µ/50V.	P. 50, C-5	The performance of PLL phase comparator is poor. The comparator is used to produce Error signal for Color phase compensator.	- When picture color is uneven, Color compensator circuits are defective. - When picture color is uneven at the top only in STILL, TANGENTIAL servo may be defective.
	-Replace C281 on DEMB.	P. 49, D-2	 Pin-25	[Producing process of H sync for TANG servo] -The edge signal of H sync on video signal is applied from Pin-7 of Z202. This signal contains pulsative noises. -The noises are eliminated by Z203, then the main signal is put out from Pin-4 of Z203 as HD2 signal. At the same time, HD1 signal should be applied from Pin-25 of Z203. (See Fig.)
	-Replace C282 on DEMB.	P. 49, D-2		
Pictures are colorless and are vibrating slightly. Spattering noises are heard intermittently. (The above problems occur after some time operation.)	-Replace Z202 (PA0009) DEMB.	P. 49, D-2	H sync for TANG servo can't be applied at Pin-7 of Z202 (PA0009).	
	-Replace C224 on SRVB.	P. 45, C-2	TRAPE signal for producing TANG ERROR is not put out from Pin-1 of Z202.	-When TRAPE signal keeps condition (A), HD2 signal is not applied to Pin-11 of Z202.
An LD disc is rejected while rotating.	-Replace C211 on SRVB.	P. 45, C-3	 (A) STOP	 (B) PLAY START
	-Replace X1 oscillator on SRVB.	P. 38, D-5		
Picture color becomes uneven after some-time operation. The operation stops intermittently.	-Replace Diode SMLA-02 on RECB.	P. 29, C-1	SMLA-02 failure. Power supply line signal contains ripple components.	-If SPDL STOP signal is high, X1 is defective. -If SPDL STOP signal is low, CONT section is defective.
				[Check method] -Observe the waveform at the emitter of Q3 (+5V). Oscilloscope: AC mode [Normal] _____ [NG] 

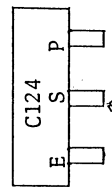
Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
Color is not locked. V sync is unstable.	-Replace X201 (VSS-020) on SRVB.	P.45, A-2	SPDL servo reference signal at Pin-1 of X201 is deviated from 15.734KHz.	*Unless Sync and Color burst signals on video signal are accurate, pictures can't be reproduced on TV monitor.
Play key can't be accepted. (Slider doesn't move to INSIDE position when power is turned on.)	-Replace Z4 (PD0011) on SRVB.	P.38, A-6	Z4, which exchanges control signals with CPU (Z1), is defective. CPU can't work.	*When power is ON, Z1 sends ATN signal to Z4 and waits for ACK signal returning from Z4. [CONTROL section check method] 1) Are Clock signals oscillated? -Z1 & Z2 should be oscillating. -Z3 (PD0010) -Z4 (PD0011)
No raster (SPDL motor rotates normally.)	-Replace Z3 (PD0010) on SRVB.	P.38, C-6		 <p>2) Is Reset signal shifted to Low when power is turned on? -When Z2 is reset, Reset signal is applied to Z1 from Pin-22 of Z2.</p> <p>3) Is Low pulse generated at Pin-31 (ATN) of Z1 when power is turned on? If not, Z1 is defective.</p> <p>4) Is Low pulse generated at Pin-14 (ACK) of Z4 when power is turned on? If not, Z4 is defective.</p> <p>5) Turn on power. Select audio L or R and depress ANT key. If the indicators on Front panel work properly, control circuit is normal.</p>
Trick play is impossible.	-Replace Z4 (PD0011) on SRVB. -Readjust Clock frequency with VCL of Z4 on SRVB.	P.38, A-6 P.22	<p>Z3 failure. Video squelch can't be released.</p> <p>Philips code can't be decoded, so CAV/CLV sense is impossible. LD player rejects all keys except SCAN key.</p> 	*Video SQ signal is also applied to Z3 by CPU. When Z3 is defective, the signal is not shifted to Low after SPDL servo is locked.
				<p>[Check method] 1) Depress DISPLAY key. If Philips code is decoded, a frame number is displayed correctly. 2) Philips code is applied from Pin-13 of Z202 (PA0009) on VDEM as DATA signal. This signal contains 5V-clipped video signal. (See Fig.) 3) When Philips code is decoded, Low pulse is applied from Pin-6 of Z4 (PD0011) as IRZ signal.</p>

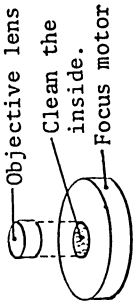
Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
Abnormal display indication	-Replace Z3 (PD0010) on SRVB.	P.38, C-6	Display indication IC failure	[Check method] -When synchronization of DISPLAY indication is unstable, check if H-sync and V-sync are applied to Pin-17 and Pin-18 of Z3 respectively. -If so, Z3 (PD0010) is defective.
Excessive drop out with an LDD disc played	-Add 2 capacitors of 27pF to F207 in parallel on DEMB.	P.49, B-2	Excessive drop out makes DOS misoperate. DOS sensitivity is a little too high.	*In LD-700, when an LDD disc is played, DOS may misoperate.
Intermittently picture skips.	-Readjust Grating & Tracking balance.	P.11	GRATING & TRACKING balance adjustments are deviated.	Grating adjustment has been changed due to circuit changes. As for the details, please refer to Service Information, SI-V38088-G.
	-Retighten the fixing screws for Pickup holders. (See Fig.)		Pickup is stuck during tilt operation, which causes track skip.	[Tilt servo check method] -When Tilt servo seems to affect the problem, disconnect Tilt motor's connector. -Make the pickup horizontal by rotating Tilt motor manually. -If a disc can be played, Tilt servo is defective.
Crosstalk Focus is unlocked. When the player is stood up, TILT servo oscillates during PLAY with beeping noises.	-Replace Q4 & Q5 on CVCB and add a capacitor of 1000pF between Pin-1 & Pin-2 of Z1. -Readjust TILT PD balance.	P.34, D-6	Tilt servo doesn't work. When Tilt limit gear stays at the center, Q4 & Q5 are defective.	
Tray can't be ejected. (with rattling noises)	-Reassemble loading motor ass'y.		Bosses for the container come off.	
Intermittently tray can't be locked.	-Replace Q8 on LOLB.	P.37, A-1	Tray moves to UP position, but Plunger doesn't work.	[Plunger operations] -In EJECT mode, the plunger is pulled backward a little to release tray's lock. Then the tray is ejected.
	-Replace C3 on LOLB.	P.37, A-2		
Tray rattles.	-Replace Plunger (VXP-009).	P.75, No.47	Plunger is defective. The center shaft for Plunger is magnetized. The plunger doesn't return smoothly, and stays at pulling position.	
	-Replace Sub roller ass'y. (VXX1025, VLL-187 & NB20FMC)		Sub roller shaft is broken.	

Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
Intermittently no effect. Abnormal noises are heard while loading.	-Replace Arm roller (VXA-175) & Belt (VEB1015).	P.74, No.14 No.11	Arm roller is worn out. Excessive load is given to Loading motor belt, then the belt slips.	Worn-out 
Focus servo gets unlocked intermittently during play, and a disc is scratched.	-Short the pattern for INTB rubber SW to make it unusable.	P.29, D-3	Poor contact of INTB rubber SW prevents Laser diode from lighting up.	*LD-700/KU ED3608901 or less LD-V4000/KU EC3605001 or less: SPDL servo had been designed to start working when LDON signal is shifted to low irrespective of FOCUS servo lock. So, when FOCUS servo is locked, Objective lens may touch a disc, then scratch it. (Refer to SI-C38047.)
Scratches on a 12-inch disc at 8-inch position	-Add DISC guard (VEB-106).	P.75, No.26	A disc touches the tray when external shock is given to the unit during play.	[Caution] Avoid moving the player or giving external shock during play.
No sound from L channel	-Replace C19 (for MUTE) on DEMB.	P.53, A-3	When C19 is defective, Muting is activated in Demodulation IC (PA3001A).	*C19 is connected to Muting input terminal of Demodulation IC.
No sound from both channels	-Replace Z6 (HAL2043) on DEMB.	P.54, B-5	CX Noise Reduction IC failure	*Audio signal is put out through CX Noise Reduction IC.
Intermittently sound distorts.	-Replace F1 (Lch), VTF-051, on DEMB. -Replace F2 (Rch), VTF-052, on DEMB.	P.53, A-1 P.53, C-1	Band Pass Filters (F1 & F2) failure. The level of RF signal for audio is low. The signal can't be demodulated to audio signal by Demodulation IC.	[BPF (F1 & F2) check method] -When RF input level at Pin-1 of Audio demodulation IC (PA3001A) is 300mVp-p or less, BPF's are defective.
Sound distorts in CX ON mode.	-Replace C83 on DEMB.	P.54, B-5	C83 is open.	C83 is used for gain control of CX Noise Reduction.
Sound distorts with specified discs played	-Add capacitors of 68pF to R18 (Lch) & R37 (Rch) in parallel on DEMB.	P.53, A-3 C-3	DOS misoperation	
Audio noises (popping noise)	-Add capacitors of 33p/16V to C4 in parallel on CTCB.	P.34, D-6	When Tilt motor operates, the voltage of (-11V) decreases. Then the level of (-5V) line for Audio circuit varies.	-When Tilt servo seems to affect the problem, disconnect Tilt motor's connector. Make Pickup horizontal by rotating the motor. Then play a disc. -If the problem disappears, Tilt servo is defective.

Problem	Countermeasure	S/M: VRT-021	Cause	Remarks
SPDL Motor is noisy.	-Replace a coil (VRT-021) on DRVB.	P.30, B-5	SPDL DRIVE signal contains high frequency components.	[SPDL motor check method] -During SPDL motor rotation, turn off power. -If the motor is still noisy, replace Mech chassis ass'y. -If the noise disappears, replace the coil.
	-Replace Mech chassis ass'y (VXX-255).	P.76, No.68	Noises are made by worn-out Motor bearing.	
No play (Disc set indicator lights up, but Loading motor doesn't stop rotating.)	-Replace SW3 (VSK-004).	P.74, No.52	SW3 is deteriorated.	*SW3 (TRAY SW) is to detect loading completion.
	-Add resistors of 330 ohms, 1/2W to Loading motor in parallel.	P.37, A-1		
The player vibrates remarkably during SPDL motor rotation.	-Replace Clamper ass'y (VXX-249).	P.71, No.9	Clamper is broken.	
Tray can't be ejected.	-Replace Belt (VEB1015).	P.74, No.11	Loading belt slips.	
	-Add 0.1mm-washers (WA20P060-010) (1 - 3 pcs.) to Worm gear.	P.74, No.82	Worm gear rattles.	
	-Loosen the lead wires of Loading motor.	P.74, No.7	The motor lead wires are stuck and plucked, which may make the motor slant.	

Problem	Countermeasure	S/M: VRT-050	Cause	Remarks
No eject, no loading	-Replace Loading belt (VEB1015) & Swing belt.	P.103, No.24	The Loading belt slips.	*Whenever servicing, replace both the loading belt and swing belt irrespective of problems.
	-Replace Worm ass'y (VXA-345).	P.103, No.23	Loading belt slips due to defective Worm ass'y.	
	-Replace Z1 (PD3032) on LOLB.	P.41, A-3	Z1 failure. Z1 (PD3032) controls Loading motor.	
No play in CD or LD mode. (Spindle motor can't be shifted.)	-Replace with Swing belt kit (GXX-020).	P.112, No.42	Swing belt slips.	*Be sure to replace Swing belt. *Avoid stretching a timing belt for Swing belt excessively.
	-Replace Z3 (Swing motor drive IC: MB3763) on LOLB.	P.41, B-2	Z3 failure. Swing motor doesn't rotate.	
	-Replace Leaf switch (VSK-003).	P.112, No.48	Poor contact of Leaf switch. The signal of SPDL motor swing completion is not applied to CPU.	[Leaf SW check method] -Observe the signals at Pin-36 & Pin-37 of Z1 on LOLB. -If both the signals are shifted to H, the leaf SW is defective. In LD mode, Pin-36 should be L. In CD mode, Pin-37 should be L.
Pictures disappear during LD play mode.	-Replace Z9 on LOLB.	P.41, A-2	Z9 or Z8 failure. After Swing operation completes, Swing motor turns in reverse for a while. Then Leaf Sw is shifted to OFF. -No play in CD --> Z9 -No play in LD --> Z8	[Z8 & Z9 check method] -Measure the resistance between E & S terminals of C124 with a multimeter. Normal: about 10k ohms Defective: about 6k ohms
	-Replace Z8 on LOLB.	P.41, A-2		
	-Improve Disc sensor sensitivity: LDSB R1, R4 270 ohms → 150 ohms R2, R3 22k ohms → 33k ohms CDSB R1 270 ohms → 150 ohms R2 22k ohms → 33k ohms	P.42, A-5 P.42, A-6	Disc sensor operation is unstable.	*When disc sense is intermittently inoperative, replace these resistors.
	-Replace X1 (4MHz) on LOLB.	P.41, B-3	X1 oscillator is defective. As the oscillating level is too low, Z1 (PD3020) misoperates.	*Z1 controls DISC SENSE, Loading motor & Swing motor, and shifts LD & CD SPDL DRIVE signals.



Problem	Countermeasure	S/M: VRT-050	Cause	Remarks
<p>No FWD SCAN. When Power is turned on without a disc, Pickup repeats moving back & forth by 2mm around PARK position, and doesn't stop.</p>	<p>-Replace Z403 (BA4558) on SRVB.</p>	<p>P.49, C-5</p>	<p>Z403 failure. Some DC current is generated from Pin-1 of Z403 and being applied to Slider motor. Under normal conditions, the DC current should be 0V.</p>	
<p>SPDL motor doesn't rotate in CD mode.</p>	<p>-Replace Z2 & Z5 (BA4558DX) on CDDM.</p>	<p>P.62, D-5</p>	<p>CD Motor Drive IC failure.</p>	
<p>It takes much time to lock CD SPDL motor.</p>	<p>-Replace Q8 (2SK30A) on LOLB.</p>	<p>P.42, C-4</p>	<p>Q8 is almost open, which is used to turn CD SPDL motor drive ON/OFF. When Q8 is defective, SPDL DRIVE signal becomes small.</p>	<p>*When Q8 is open completely, CD SPDL DRIVE signal is not applied to SPDL motor. But a CD disc may be played when Q8 is not open completely.</p>
<p>No play in CD mode</p>	<p>-Replace Z401 (PM4001) on SRVB.</p>	<p>P.50, B-4</p>	<p>Z401 (PM4001) failure</p>	
<p>Crosstalk in LD mode Intermittently no play in CD mode.</p>	<p>-Replace TILT motor belt. -Replace Tilt sensor.</p>	<p>P.109, No.17 P.109, No.5</p>	<p>As Tilt motor belt slips, Pickup remains slanted. So, Focus can't be locked in CD mode intermittently. The thermal characteristic of Photo transistors for Tilt sensor is poor. So, Tilt servo misoperates.</p>	<p>*In FOCUS servo, Equalizer for CD is different from that of LD. Focus servo gain for CD is smaller than that of LD, and the movable range of Objective lens in CD mode is narrower than that of LD mode. So, If Pickup has been slanted due to TILT servo failure, Focus lock and play are inoperative in CD mode.</p>
<p>Track skips in both CD & LD modes. Intermittently no play.</p>	<p>-Remove the objective lens from Focus motor and clean the inside of Focus motor hole. (See Fig.) -Replace Pickup and readjust Optical axis and Grating. -Replace Ball holder (VLL-282).</p>	<p>P.109, No.8</p>	<p>Focus lens is stuck. Pickup optical axis is deviated. Ball holder for Clamper holder is worn out.</p>	
<p>Track skips only in CD mode.</p>	<p>-Replace CD motor centering spring (VBH1001).</p>	<p>P.100 P.112, No.13</p>	<p>CD clamp pressure is too small to clamp a disc completely.</p>	<p>[Ball holder replacing method] -Remove a ball holder stuck to Clamper holder (A) using (-) screwdriver. -Stick a new ball holder to Clamper holder with adhesive. -If a steel ball (#15) has been scratched or worn out, replace it with a new one (VNH-026).</p>
<p>(Continued)</p>				

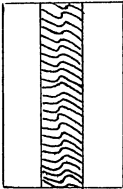
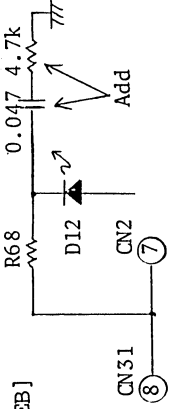
Problem	Countermeasure	S/M: VRT-050	Cause	Remarks
Track skips only in CD mode.	-Readjust Grating at frame #14,000 on LD test disc (track pitch: 1.67 μ m).	P.16	CD discs of high eccentricity are loaded.	*There are LD discs of different track pitches (1.35 μ m - 1.82 μ m) introduced into the markets. In the Service Manual, 1.35 μ m, frame #15,000 (F-series test disc) are used for grating adj. On the other hand, the track pitch for CD is 1.6 μ m. So, when a CD of high eccentricity is loaded, trackability becomes poor.
No play in LD mode. SPDL motor starts rotating, but stops immediately. CD play is normal.	-Readjust Inside limit.	P.19	Potential gear position is deviated. Pickup moves to inner tracks beyond the receivable range for RF signal. (RF & TRKG ERROR signals are small and interrupted.)	*Whenever replacing Mech ass'y, check INSIDE LIMIT adjustment. *In CD mode, potentiometer is not used.
No sound with an LDD disc. CD motor keeps rotate in reversed direction.	-Replace X1 on CDDM. -Replace Z6 (CD decoder IC, TC9179F) on CDDM.	P.61, B-3 P.61, C-3	Reference clock doesn't oscillate. (8.47MHz signals are applied at Pin-52 & Pin-53 of Z6.)	[CD-Decoder-circuit check method] -When CD discs are unplayable, play an LDD disc. -If digital sound is not reproduced, CD Decoder IC & X1 are defective. -If so, Drive circuit for CD motor is defective.
CD SPDL motor rotation is uncontrollable. No play in CD mode, No sound with an LDD disc.	-Replace Z7 (TC9178AF) on CDDM.	P.62, C-5	EFM Decoder IC (Z7) failure.	*When EFM signal is not decoded, SPDL servo can't operate in CD mode. [TC9178AF check method] -Verify that FSLO (Frame Sync Lock) at Pin-55 of Z7 (TC9178AF) is shifted to Low in LDD play mode. -If not, TC9178AF is defective. In LDD play mode, when FSLO signal is shifted to Low, CPU can sense an LDD disc loaded.
	-Replace D1 (RF Det) on CDDM.	P.62, B-4	D1 as part of RF detector is defective.	*If RF Detector consisting of Q1, Z3, Q2 & etc. is defective, RF signal (at Q2's collector) is not shifted to Low. Then Z4 can neither make reference clock from EFM signal (RF) nor decode EFM signal.

Problem	Countermeasure	S/M: VRF-050	Cause	Remarks
Audio noise with an LDD disc.	-Replace Z6 (TC9179F) on CDDM.	P.61, C-3	Z6 (TC9179F) failure. Address signal doesn't change.	[Digital IC check method] Generally, Address and Data signals applied from a digital IC can't be checked only by observing the waveform on an oscilloscope. But when a digital IC is defective, its output keeps H or L and doesn't change. So, When Address and Data signals observed on an oscilloscope are pulsative, you can judged that they are normal.
No sound in both CD & LDD modes (CD servo and time display are normal.)	-Replace Z13 (CX20017) on CDDM.	P.67, A-1	D/A converter (Z13) failure.	[D/A converter check method] -When all play operations except sound are normal, D/A converter and the circuits following it are defective.
	-Replace Z16 (NE553P) on CDDM.	P.68, A-9	OP amp (Z16) failure.	-Check the input signals: Pin-48: BCK, Pin-50: WDCK, Pin-51: L/RG, Pin-47: DA-7
No sound in both LD & CD modes. (LD analog sound is not reproduced.)	-Replace RL3 (VRS-005) on CDDM.	P.68, A-5	Poor contact of the relay.	*In LD mode, the signal coming from Audio output 2 (silver plated) and RF converter can be normally reproduced.
Audio noise after LDD search	-Change D18 from 1S2473 to AHZ3BZ on CDDM.	P.61, D-3	The characteristic of OP amp. is poor.	*When CD operations are normal but LDD sound is NG, 1.75MHz-LPF on LDDB and/or VCXO circuit (around Z12 on CDDM) might be defective.
	-Replace D10 (1S2339) on CDDM.	P.61, B-3	X1 doesn't work as VCXO.	
No output in LDD mode (normal in CD mode)	-Replace 1.75MHz-LPF (VTF-057) on LDDB.	P.61, A-2	LPF failure. EFM signal can't be extracted from RF signal.	

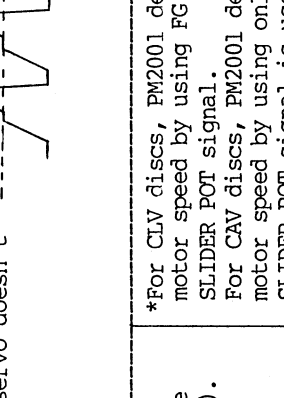
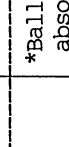
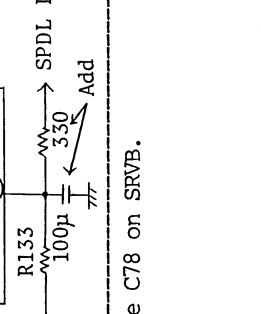
Problem	Countermeasure	S/M: VRT-050	Cause	Remarks
When power is turned on, stripes appear and play is impossible. Play becomes possible after the stripes disappear.	-Resolder C3 on Power supply circuit.	P.33, B-2	Poor soldering of C3 Ripples generated in Power supply line affect quasi video signal and CPU.	
During CD play, Display is out of sync.	-Change as follows on DEMB: R341 15k ohms --> 1.5k ohms C333 470pF --> 270pF	P.71, B-3 C-2	As quasi sync signal is unstable, H sync & V-sync applied to Display IC become unstable.	[Check method] -Verify that composite sync signal is constantly applied at Pin-11 of Z202 (PA0009). -If not, make the circuit change (R341, C333) on DEMB. *Composite sync signal is also applied at pin-14 of Z202. But for accurate check, observe it at Pin-11 of Z202.

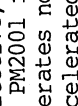
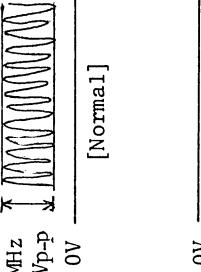
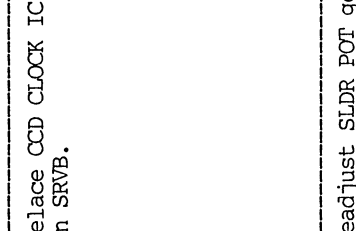
Problem	Countermeasure	S/M: VRT-057	Cause	Remarks
Rattling noise when power is turned on. No play No eject	-Replace Q11 (Drive Tr: 2SD1226M) on DRV.B.	P.12, B-4	Q11 failure.	*When Q11 and/or PM4001 are defective, SLDR motor keeps rotating but Pickup doesn't move to Inside position.
	-Replace PM4001 on SRVB.	P.23, B-3	PM4001 failure.	
When power is turned on, or during play, SPDL motor becomes uncontrollable. During play, a disc is ejected suddenly, then play is inoperative.	-Replace X1 (VSS-043:14MHz) on SRVB.	P.27, A-3	X1 and/or Q16 failure. The X1 oscillating level as reference signal is too low.	*The optimum oscillating level at Pin-29 of PM2001 is 3 ~ 3.5Vp-p.
	-Replace Q16 on SRVB.	P.27, A-3		
No play (Laser doesn't light up.) The tray is ejected a few seconds after play key is depressed.	-Replace D9 on SRVB.	P.57, C-2	D9 failure.	*When play key is depressed, the base of Q15 on SRVB doesn't become 5.6V. Then, power can't be applied to Laser diode.
	-Replace Tilt sensor.	P.15, C-2	Tilt sensor and/or Q12 failure.	[Tilt sensor check method] -Measure the output of laser diode on the objective lens with a laser-power meter. -If the output level is 0.6mW or so, the laser diode is normal. -Disconnect CN34 of TILT motor and make Slider shaft horizontal. -Short the collector of Q206 on SRVB and GND. -If play is operative, Tilt sensor is defective.
No play (no disc sense)	-Replace Q12 on PRBB.	P.15, D-3	-Tilt sensor also works as Disc sense. So, when Tilt sensor is defective, disc sense is impossible. -When Q12 is on, disc sense becomes possible. If Q12 is defective, disc sense is inoperative.	
	-Replace Pickup.	P.77, No.1	The holding part for Objective lens comes off from the Pickup.	[Check method] -Verify that Objective lens goes up and down smoothly when Play key is pushed. -If not, Pickup or tilt sensor is defective.
No focus lock intermittently Excessive crosstalk and out of sync. External shock stops player's operation.	-Replace Tilt sensor.	P.15, C-2	Tilt sensor failure. Slider shaft is kept slanted.	
	-Replace a spring (VBH-148).	P.75, No.38	Broken spring.	*When the spring and the switch are defective, Loading IN switch can't be shifted to ON.
No loading	-Replace SW (VSK-011).	P.75, No.41	Poor contact of the SW.	
	-Replace Loading belt.	P.75, No.26	Loading belt slips.	*Even after loading operation is completed, Clamp SW is not shifted to ON.
The tray is ejected soon after loaded.	-Short D11 between Pin-1 and Pin-11 of IC3 (MB3763).	P.12, D-5	Poor characteristic of IC3	
	-Adjust Clamp sw.	P.67	Clamp SW adj is deviated.	


Problem	Countermeasure	S/M: VRT-057	Cause	Remarks												
Neither loading nor eject	-Resolder C107 on RECB.	P.11, C-2	Poor soldering of C107.	*The power supply contains many ripple components, so CPU can't operate.												
When the tray without a disc is pushed in, it is ejected.	-Stick Black tape (VRW1023) on Bridge.	P.75, No.1	DISC sense misoperates when Tilt sensor is replaced with new type.	*After Disc sensor using Tilt sensor operates, if FOCUS servo can't be locked, the tray is ejected.												
Loading motor keeps turning. No keys are accepted. No eject.	-Replace X201 (VSS-035: 4MHz) on SRVB.	P.19, C-3	X201 failure. CPU can't operate.	[CPU replacing method in LD-707] -Replace CPU with PD3060.												
Play LED suddenly flickers during play, then the player stops.	-Replace IC201 (CPU: PD3060).	P.19, C-3	IC201 failure.	-Remove CDCR or INIB board and make the following circuit changes:												
			<table border="1"> <thead> <tr> <th>OLD</th> <th>NEW</th> <th>MODIFICATION</th> </tr> </thead> <tbody> <tr> <td>PD3049 with CDCR</td> <td>PD3060</td> <td>- Remove CDCR and cables. - Connect Pin-7 of IC204 to Pin-5 of IC203. - Replace capacitors, C203 & C204. 47pF → 30pF (CCDSL300J50)</td> </tr> <tr> <td>PD3054 with INIB</td> <td>PD3060</td> <td>- Remove INIB and cables. - Replace capacitors, C203 & C204. 47pF → 30pF (CCDSL300J50) - Remove C214 (0.1µF), if it is mounted.</td> </tr> <tr> <td>PD3060</td> <td>PD3060</td> <td></td> </tr> </tbody> </table>	OLD	NEW	MODIFICATION	PD3049 with CDCR	PD3060	- Remove CDCR and cables. - Connect Pin-7 of IC204 to Pin-5 of IC203. - Replace capacitors, C203 & C204. 47pF → 30pF (CCDSL300J50)	PD3054 with INIB	PD3060	- Remove INIB and cables. - Replace capacitors, C203 & C204. 47pF → 30pF (CCDSL300J50) - Remove C214 (0.1µF), if it is mounted.	PD3060	PD3060		
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PD3060	PD3060															
			After CPU is replaced, the following adjustments should be made: 1) INSIDE POSITION DETECTION ADJ (VR8) 2) 12-INCH OUTSIDE POSITION DETECTION ADJ (VR9) 3) 8-INCH OUTSIDE POSITION DETECTION ADJ (VR10) As for the detailed procedures, please refer to the service manual for LD-717 (ARPL217, P.52).													
Intermittently no SPDL lock. No SPDL lock.	-Replace 220ns delay line on DEMB.	P.35, B-3	220ns delay line failure.	*As Video signal is not applied, H-sync for SPDL servo can't be extracted.												
	-Replace Q12 on PREB.	P.15, D-3	Q12 is shorted.	* As there is no signal to be applied from one side of Tilt sensor, Tilt motor turns to the max. Then, Pickup is slanted at the max degrees.												

Problem	Countermeasure	S/M: VRT-057	Cause	Remarks
No eject. No keys are accepted. SPDL motor doesn't rotate intermittently. SPDL motor rotation is not accelerated. No SPDL lock.	-Resolder the connector of BLMB. -Replace SPDL motor.	P.28, C-5 P.27	Poor contact of Connector. +14V is not applied to BLMB. SPDL motor failure. (Defective Drive Tr on BLMB)	*When power is turned on, SPDL motor doesn't rotate. Then, SPDL STOP signal remains Low. When SPDL STOP signal is High (+5V), EJECT is operative. [SPDL motor ass'y check method] -In LD-700 and newer models, PA2016 has been employed for SPDL DRIVE IC. This IC can sense that SPDL motor stops when the motor rotates in reverse for an instant. So, if SPDL DRIVE IC is defective, the motor can't sense it and EJECT becomes inoperative. -When SPDL motor doesn't rotate intermittently, or is not accelerated, the motor might have a dead point. Check as follows: 1) Holding a disc by hand firmly, push Play key. 2) After FOCUS servo is locked, rotate the disc slowly. 3) While rotating the disc, if you find a dead point in driving, Motor ass'y is defective.
Pictures become colorless intermittently with a CLV disc. No play, SPDL motor keeps reverse rotation.	-Replace ICL01 (PM2001) on STBC.	P.69, C-2	SPDL Lock signal at Pin-6 of ICL01 is shifted to High during PLAY.	
After some-time play, pictures become colorless, sync is unstable, then the tray is ejected.	-Replace SPDL DRIVE IC (PA2016) on BLMB.	P.28, D-4	Poor thermal characteristic of PA2016	
After 15 to 20-minute play, pictures become colorless, then the tray is ejected.	-Replace H sync SEP IC (PA0018) on SRVB.	P.27, B-2	Poor thermal characteristic of PA0018. H-sync can't be extracted.	
Beat noises on a screen 	-Change R28 from 47 ohms to 100 ohms on DRV.B. -Add a capacitor & a resistor to PREB. (See Fig.)	P.11, B-3 P.16, A-5	Slider servo oscillates.	[PREB] 

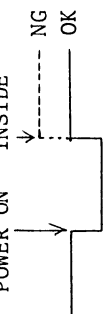
Problem	Countermeasure	S/M: VRT-057	Cause	Remarks
It takes excessive time to play and/or search. Intermittently mis-search.	-Adjust TRKG BALANCE. -Adjust GRATING.	P.62 P.63	As TRKG BALANCE adjustment is deviated, it is difficult to close TRKG servo.	
Rattling noise coming from Tilt servo after search.	-Change R56 from 8.2k ohms to 12k ohms on PREB.	P.16, D-4	Due to sensitivity dispersion of Tilt sensor, the servo gain becomes too high.	*Loose worm gear of Tilt motor makes rattling noises.
With rattling noise, play is inoperative. Rattling noise during search mode. Slow FF SCAN.	-Apply grease to Slider shaft.	P.77, No.4	The grease applied to Slider shaft becomes stiff and prevents Pickup from moving smoothly.	[Caution] In the models other than LD-707, LD-717 & CLD-909, it is inhibited to apply grease to Slider shaft. The surface has been coated by Teflon.
Pictures are colorless or distorted.	-Replace IC3 (PA0017) on SRVB.	P.31, B-3	CCD Clock is unstable.	[PA0017 check method] 1) Clock signal at Pin-6 of IC3 can be observed (9.6MHz, 1.5Vp-p). 2) If the clock is not oscillated when power is on, PA0017 is defective.
On bright pictures, sync is unstable. No pictures (sound is OK.)	-Replace IC5 (PA9003) on SRVB. -Replace C26 on SRVB. -Replace C117 on SRVB.	P.32, B-5 P.32, B-4 P.32, B-5	As no input is applied to Differential amp of PA9003, the output level of video signal varies.	*If sound is OK, but Video ginal is NG, PA9003 and its surrounding curcuits are defective.
Black noises on inner tracks.	-Replace C10 on PREB.	P.16, A-4	Noises are superimposed on RF signal.	
Vertically-oscillating red stripes.	-Add capacitors of 10pF/16V to C156 in parallel on SRVB (TBC).	P.31, A-3	Noises coming from Power supply line are applied to Video signal.	
Horizontal color noises	-Change the following on DEMB. C216 --> Delete C217 330pF --> 47pF R234 2.2k --> 1.8k	P.35, A-2 B-3	Drop-out sense circuit misoperates.	
Uneven color at the top frame.	-Adjust CPC.	P.66	CPC adjustment is deviated.	*When CPC adjustment is deviated, pictures can be colored, but uneven color or flicker may appear on red pictures.
LED's except POWER LED don't light up.	-Replace Display IC (PD0012A) on DISP.	P.39	Display IC failure.	*Only LED's on Front panel don't light up, but other functions work normally.

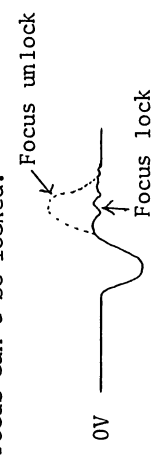
Problem	Countermeasure	S/M: VRT-057	Cause	Remarks
<p>Pictures become colorless on outer tracks with a CLV disc. Intermittent sound. (especially with LD discs of excessive eccentricity)</p>	<p>Change circuits on SRVB: -Add a capacitor of 10µF between R135/D6 and GND. -Change R132 from 200k ohms to 15k ohms. -Add a resistor of 330 ohms & a capacitor of 100µF to Pin-29 of IC7 (PA5009) as shown below.</p> 	<p>P.31, C-3 P.32, D-4</p>	<p>ERROR signal of excessive level is applied to CCD, so Video signal is lost for an instant.</p> <p>If this level is too high or too low, CCD servo doesn't work.</p> 	<p>[CCD servo check method] -Observe the waveform at Pin-9 of IC7 (PA5009). -Verify that a trapezoidal waveform doesn't change. -If so, CCD servo is defective.</p>
<p>-Replace C78 on SRVB.</p>		<p>P.28, B-5</p>	<p>C78 leakage. SLDR POT signal can't be applied to IC10 (PM2001).</p>	<p>*For CLV discs, PM2001 detects SPDL motor speed by using FG signal & SLIDER POT signal. For CAV discs, PM2001 detects SPDL motor speed by using only FG signal. SLIDER POT signal is used for RF CORRECTION.</p>
<p>Pictures are colorless, get darker, then become a black screen. No SPDL servo lock.</p>	<p>-Replace C244 connected to Pin-4 of IC201 (PA3014) on DEMB.</p>	<p>P.35, B-2 IC202</p>	<p>C244 leakage. DOC (Drop Out Compensator) is kept activated. Only 1H Delay signal is applied.</p>	<p>[DOC circuit check method] *In LD-707 or newer models, a looped circuit has been employed as DOC. So, if DOC is kept activated, Video signal is lost. 1) Connect Pin-15 of IC201 to GND. 2) If the problems disappear, DOC circuit or 1H Delay IC is defective.</p> 
<p>Excessive vibration while SPDL motor is rotating. Rattling noise during Play and pictures are colorless. SPDL motor rotation is uncontrollable.</p>	<p>-Replace a ball holder (VLL-282). -Add a rubber mat (VEE-129) to Clamper holder. -Replace with Clamper holder kit.</p>	<p>P.75</p>	<p>Worn-out ball holder.</p>	<p>*Ball holder's vibration can be absorbed by a rubber mat inserted between Clamper holder & Ball holder. *Clamper holder kit for LD-707, GXX-023 consists of: Clamper holder VNE-837 Rubber mat VEE-129 Ball holder VLL-282 Holder plate VNE-689 Holder securing tape VEC-262</p>

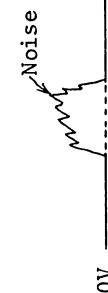
Problem	Countermeasure	S/M: VRT-057	Cause	Remarks
<p>After some-play, pictures become colorless, sync is unstable. No sound. SPDL motor rotates but no pictures appear. (The tray is ejected 1 minute after.)</p>	<p>-Replace CCD IC (TL8614P) on SRVB.  White mark: Selected part</p>	<p>P.31, B-2</p>	<p>CCD IC or CCD CLOCK IC failure. Video signal can't be put out. [PA0017 Pin-6]  9.6MHz 1.5Vp-p 0V [Normal] 0V -3.5V [NG]</p>	<p>*Even if CCD and related circuits are defective, SPDL LOCK signal at Pin-6 of PM2001 is Low. So, SPDL servo operates normally and SPDL motor is accelerated to the normal speed. [CCD check method] 1) CCD clock IC check -Observe CCD clock signal at Pin-6 of PA0017 in STOP mode. -If CCD clock signal is not oscillated normally, PA0017 is defective. 2) CCD IC check -Observe Video input & Video output at Pin-11 & Pin-22 of CCD IC (TL8614P). -When the video signal is not applied, TL8614P is defective.</p>
<p>When play key is depressed, TRKG servo remains open and no pictures appear.</p>	<p>-Readjust SLDR POT gear position. -Readjust INSIDE & OUTSIDE.</p>	<p>P.60</p>	<p>SLDR POT gear position is deviated. Pickup moves to excessively inner tracks and can't catch RF signal. RF signal & TRKG ERROR signal are too small, and intermittent.  Pinion A SLDR POT Pinion B</p>	<p>[SLDR POT pinion B positioning] -Move the SLDR to inner tracks fully. -Viewing SLDR POT pinion B from VR side, turn it counterclockwise fully and make it engage with Pinion A. -Turn the Pinion B clockwise by 5 teeth. -Make INSIDE & OUTSIDE (12 or 8 inch) adjustments in accordance with the service manual.</p>
<p>-Replace Pickup. -Replace IC3 (NJW458S) on PREB. -Replace DRIVE TR Q16 (2SB910M) on DRVB.</p>	<p>P.15, A-2 P.16, C-4 P.12, C-5</p>	<p>TRKG coil shorted. TRKG ERROR signal can't be applied to TRKG coil.</p>	<p>[FOCUS, TRKG coil check method] -Measure coil's resistance using a multimeter. The optimum DC resistance: FOCUS coil --- 8 to 9 ohms TRKG coil --- 10 to 11 ohms *When Drive transistor is shorted, TRKG coil will be burnt out.</p>	<p>[FOCUS, TRKG coil check method] -Measure coil's resistance using a multimeter. The optimum DC resistance: FOCUS coil --- 8 to 9 ohms TRKG coil --- 10 to 11 ohms *When Drive transistor is shorted, TRKG coil will be burnt out.</p>

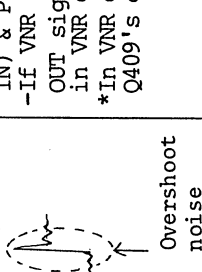
Problem	Countermeasure	S/M: VRT-057	Cause	Remarks
No pictures appear, then the tray is ejected 1 minute after. Noisy pictures, out of sync. Pictures become colorless after some-time-play. Uneven color, warped picture	-Replace C96 on SRVB.	P.32, C-6	H sync can't be applied at Pin-20 of IC7.	<p>*IC7's functions: 1.To extract H sync signal from composite signal. 2.To produce a triangle signal from reference H sync, and compare it with PB H by sampling and hold to extract Phase error as Voltage error. → CCD Error 3.To extract Color burst signal from Video signal and compare phase with 3.58MHz reference signal. → Error for Color phase compensator [IC7 & surrounding circuit check method] -If capacitors & resistors connected with Pin-12 to Pin-18 of IC7 are defective, H sync can't be applied at Pin-20 of IC7. -If capacitor & resistors connected with Pin-5 to Pin-10 of IC7 are defective, Trapezoide waveform can't be obtained at Pin-10 of IC7. [Optimum waveform at Pin-9 of IC7]</p>
	-Replace C97 on SRVB.	P.32, D-5		
	-Replace D23 on SRVB.	P.32, C-6		
	-Replace VR5 on SRVB.	P.32, C-6		
	-Replace C93 on SRVB.	P.32, C-5	A trapezoide or triangle signal can't be applied at Pin-10 of IC7.	
The tray is ejected with a disc rotating.	-Replace VR4 on SRVB.	P.32, C-5		<p> [POWER ON] [Before SERVO LOCK] [SERVO LOCK]</p>
	-Replace IC7 (PA5009) on SRVB.	P.32, C-5		
	-Change a rubber spacer from VEB-111 to VEB1008.	P.77, No.7	A disc slips on a tray. Even after the motor stops, the disc keeps rotating due to inertia.	
Audio distorts at L-ch. Intermittent sound.	-Replace SPDL motor.	P.77, No.8	SPDL motor shaft comes off from the motor base.	<p>[Check method] When SPDL STOP signal is High, EJECT is acceptable. -Verify that SPDL STOP signal is Low during Play and then it is shifted to High when SPDL motor stops. -If so, this is due to mechanical problems such as disc slip.</p>
	-Replace F1 (2.3MHz BPF) on DEMB	P.35, C-1	As Audio RF signal is too small, it can't be demodulated.	
	-Replace MUT FET (2SK117) on DEMB	P.36, C-5	Mut FET leakage. Muting misoperates due to Mut FET failure.	

Problem	Countermeasure	S/M: VRT-057	Cause	Remarks
Sound distorts at both channels.	-Replace C43 on DEMB.	P.36, D-4	CX NR gain control is unstable.	
No digital sound.	-Replace NJM79L06A on LDDB.	P.43, D-2	Constant voltage power supply IC for LDD is defective.	
No digital sound after some time-play.	-Replace NJM79M12A on LDDB.	P.43, D-2		
No digital sound. Noises.	-Replace D/A converter (PCM56P-J) on LDDB.	P.43, A-3,4	D/A converter failure.	[D/A converter check method] -Verify that necessary input signals (LRCK, WCLK, BCLK & DIN) are applied to D/A converter. -If all the signals are applied, D/A converter itself is defective.
Sound distorts, intermittent sound. (at AUDIO 1 output)	-Replace RAM (HM6116FP) on LDDB.	P.43, C-4	RAM failure.	
	-Replace Relay (VSR-005) on LDDB.	P.43, A-6	Poor contact of Relay.	*A relay is not used for Audio 2 output. If the relay is defective, only Audio 1 output becomes NG.

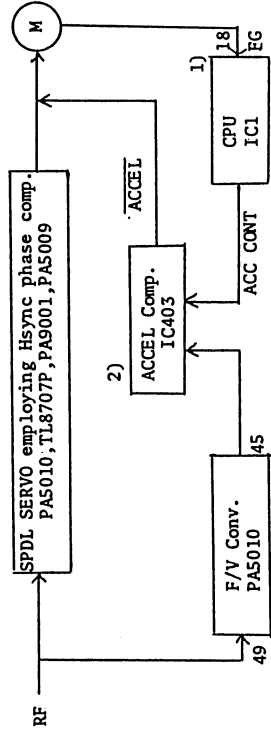
Problem	Countermeasure	S/M: ARP1191	Cause	Remarks
Loading is operative but Eject is not.	-Replace IC104 (PD5029) on DSDC. -Readjust Rotary encoder gear position.	P.50, A-5 P.19	PD5029 can't decode EJECT key input. Rotary encoder can't detect Loading motor START & STOP positions.	*If PD5029 is defective, all key inputs are rejected. However, in CLD-909 employing Auto loading & Auto start functions, only play is possible. [Rotary encoder positioning] -When the tray is at UP position, and Front door is closed, the hole mark on Rack gear should meet with that of Rotary encoder gear.
No eject.	-Adjust LD INSIDE with VR8 on SRVB.	P.27	LD INSIDE adjustment is deviated extremely.	*When an LD disc is loaded, if INSIDE signal (CN10-5) is shifted to High, EJECT is impossible. *In CLD-909, severe INSIDE & OUTSIDE LIMIT adjustments are not so necessary as in LD-707.
No play (with rattling sound)	-Replace IC8 (PM4001) on SRVB.	P.58, B-4	PM4001 failure. When power is turned on, (+) DC voltage is applied from Pin-5 of IC8. Then, Pickup moves to outer tracks.	[Waveform at Pin-18 or Pin-5 of IC8] POWER ON INSIDE  *As Pin 13 & Pin 5 are connected by a resistor, the same waveform can be observed. But their voltage levels are different.
Intermittent inoperative. (with rattling sound from the inside.)	-Replace IC107 (SN74LS00N) on DSDC.	P.49, A-3	SN74LS00N failure. CPU misoperates and makes SLDR motor keep rotating.	*IC107 is used for selecting IC's when CPU controls EXPANDER I/O (IC102 & IC103) and EP ROM (IC111) for operational program memory. In general, when a logic IC (ex.IC107) is defective, its output level is constant at Low or High.
No play in LD & CD modes. Play lamp flickers and play & eject are inoperative.	-Replace SLDR motor (VXM-066).	P.106, No.1	SLDR motor failure. When a disc is loaded, Pickup can't move to INSIDE (or 12-inch OUTSIDE). So, the operation can't go to the next step.	[SLDR motor check method] 1) Pull the tray forcibly, then turn the power ON. -If the pickup doesn't move to 8-inch OUTSIDE or CD INSIDE, SLDR motor is defective. 2) Load a disc. -If the pickup doesn't move to INSIDE, SLDR motor is defective.

Problem	Countermeasure	S/M: ARP1191	Cause	Remarks
When an LD disc is loaded, the mode is not shifted from CD to LD, play is impossible. Soon after an LD disc is loaded, the tray is ejected. CD operation is normal.	-Replace IC13 (BA6218) for CD motor swing.	P.58, B-5	IC13 failure. CD motor can't swing down.	*In CD mode, when an LD disc is loaded, the disc can't be clamped, then it is ejected. If it is not ejected, Clamp Sw adjustment is deviated at the same time.
	-Replace D1 (LD sens) on SENS.	P.76, B-4	D1 failure. The mode can't be shifted to LD.	
No play in LD & CD modes.	-Replace TILT sensor.	P.108, No.16	TILT sensor failure. DISC sens is inoperative.	When a new Tilt sensor (VEX1001) & EP ROM (VW1012) have been employed, CD/LD sensor does DISC sense instead of TILT sensor.
No play in LD & CD modes. (No Focus lock)	-Replace IC14 (TC4053BP) on SRVB.	P.57, A-2	IC14 failure. FOCUS offset signal is applied from Pin-1 of IC2. Focus can't be locked.	[FOCUS lock check method] -Observe the waveform at Pin-26 of IC8. -Depress Play key. -If an S-shaped waveform appears, Focus can't be locked. 
Strang noise in CD mode.	-Replace Clamper ass'y with Clamper kit. -Add a resistor of 22 ohms to R164 (2.7 ohms) in parallel on SRVB.	P.58, B-5	Worn-out ball holder for Clamper makes abnormal vibration, which may cause track skip.	Clamper kit, GXX-040, consists of: Rubber mat VEB-129 Holder VNE-689 Holder securing tape VEC-262 Ball holder VNL1034 Clamper VXA-474 *Clamper holder (VXA-411) is not contained in the above kit. *Apply grease (GYA-008) to the contact part of a steel ball and ball holder.
CD SPDL motor doesn't rotate.	-Replace CD SPDL motor (VXX-529).	P.106, No.2	CD SPDL motor failure.	[CD SPDL motor check method] -Verify if FOCUS servo is locked and SPDL DRIVE signal is applied to CD SPDL motor. -If so, CD SPDL motor is defective.
Stops during CD play.	-Replace Clamper ass'y.	P.100, No.35.	A steel ball inside CD clamper ass'y is rusty.	*CD SPDL motor rotation speed is slow. So, slight failure may cause track-skipping and malfunction.

Problem	Countermeasure	S/M: ARP1191	Cause	Remarks
Intermittently no play in CD. (No SPDL lock) Sound skip on inner tracks in CD mode.	-Readjust CD motor tilt. -Readjust CD motor centering.	P.17	As CD SPDL motor is slanted, EFM signal can't be read and SPDL servo can't be locked.	*CD SPDL motor tilt and centering adjustments are more sensitive than those of LD SPDL motor. Their slight deviation will disturb FOCUS lock & SPDL lock. [CD motor tilt adjustment] Before the electrical adjustment described in the Service Manual is made, roughly adjust the CD SPDL motor so that its turntable becomes horizontal.
Mis-search with specified LD discs. (Excessive drop out)	-Readjust LH Delay video level with VR501.	P.31	LH delay video level is deviated. When Drop Out Compensator is activated, H sync for SPDL can't be extracted.	
Display characters flow during LD search.	-Readjust VC101 on DSDC.	P.40	VC101 is deviated from 3.00MHz. PD0011 can't decode Philips code.	
Display characters flow during LD search.	-Replace IC203 (SN74LS05N) on STBC.	P.69, A-2,3	IC203 failure. H sync 2 & V sync 2 are not applied to DISPLAY IC.	*H sync & V sync for Blue signal and those for Play back signal are shifted by IC202 & IC203. They are applied as H sync 2 & V sync 2 to DISPLAY IC.
Display characters vibrate up and down.	-Replace IC105 (PD0010) on DSDC.	P.49, B-2	DISPLAY IC (IC105) failure.	[Check method] -Verify that H sync and V sync are applied to IC105 accurately. -If so, DISPLAY IC is defective.
In LD mode, when power is turned on, "LASER VISION" indication flickers or disappears. LDP indicator on Front panel flickers.	-Replace CD motor release SW.	P.106, No.12	Poor contact of the SW. High-level noises are generated on CDM RELEASE signal applied from Pin-4 of CN16 intermittently.  0V	[DISPLAY & the SW] CN16 *Pin-3 (CDM SET): L (0V) } CD mode Pin-4 (CDM RELEASE): H (5V) }--"COMPACT DISC" *Pin-3 : H }----- LD mode Pin-4 : L }----- "LASER VISION" *Pin-3 : H }----- While CD SPDL motor is Pin-4 : H }----- swinging, no indication *In LD mode, when pin-4 sometimes becomes H, "LASER VISION" disappears. DISPLAY IC (PD0010) seems defective mistakenly.

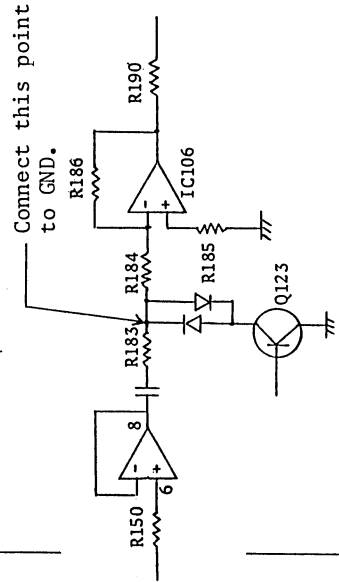
Problem	Countermeasure	S/M: ARP1191	Cause	Remarks
Ghost in LD mode.	-Replace C426 on STBC.	P. 70, B-5	C426 is open. STBC IC301 Pin-13(VNR IN) Pin-12(VNR OUT) 	[Video Noise Reduction (VNR) circuit check method] -Observe the waveforms at Pin-13 (VNR IN) & Pin-12 (VNR OUT) of IC301. -If VNR IN signal is optimum but VNR OUT signal has overshoot noises, C426 in VNR circuit is defective. *In VNR circuit, the optimum level of Q409's collector is 0.7Vp-p.
Remakable noises on a screen in LD mode. (especially with old discs)	-Add a capacitor of 120pF to R620 on VDEM in parallel.	P. 61, B-2	Resolution has been improved to 400 lines. No failure.	*Addition of capacitor can reduce noises, but resolution gets worse. *This remedy should be taken only for customer's satisfaction.
No LDD sound. CD play is impossible. (No SPDL lock)	-Replace X301 (VSS-040) on DSDC.	P. 53, B-3	Clock for Decoder IC is defective. EFM signal can't be decoded.	*When neither LDD sound is reproduced nor CD SPDL servo is not locked, D/A converter or the preceding circuits are defective.
Sound distorts in LDD & CD modes. Intermittent crackling noise. Hum noise after some-time play. (CD SPDL servo is normal.)	-Replace IC305 (CX23035) on DSDC.	P. 53, B-2	Poor soldering of Decoder IC (CX23035).	*When crackling noises are generated due to poor soldering of CX23035, CD play operations except sound are normal. So, mistakenly RAM or the circuits following D/A converter seem defective. -Be sure to check all input signals applied to D/A converter (LRCK, WCLK, BCLK & DIN). (See the service manual for CLD-900, VRT-050, Page 28.)
	-Replace D/A converter (CX20152) on DSDC.	P. 53, B-3	D/A converter failure.	
	-Replace IC304 (HM6116FP-4) on DSDC.	P. 54, B-4	RAM failure.	
In LDD & CD modes, high-frequency-range sound can't be reproduced.	-Replace Q402 (25C1740) on DSDC.	P. 54, C-5	De-emphasis remains ON.	*De-emphasis is automatically turned ON & OFF when CPU decodes Sub code recorded on a disc.
No sound in LDD & CD modes. (CD SPDL servo is normal.)	-Replace IC404 (TC4053BP) on DSDC.	P. 54, D-4	IC404 as Deglitcher is defective. Audio signal can't be reproduced.	*Deglitcher eliminates overshoot noise, which is generated when Lch signal & Rch signal are converted from digital signal to analog signal alternately. When Rch signal is reproduced, Lch signal is connected to GND.

Problem	Countermeasure	S/M: ARP1559	Cause	Remarks
<p>No play in LD & CD modes. (No disc sense)</p>	<p>-Replace Park switch. -Replace Pickup.</p>	<p>P.13, No.25</p>	<p>Poor contact of Park SW. Pickup moves to the utmost outer tracks, disc sense is inoperative. Laser diode doesn't light up. Focus lock & disc sense are impossible.</p>	<p>[DISC detection] First, Pickup is at PARK SW position. When a disc is loaded or Play key is depressed, the pickup moves to 8-inch LD OUTSIDE (LD sense) & CD INSIDE (CD sense). At each position, the pickup checks whether or not FOCUS servo is locked as follows: -LD DISC: Focus locked at LD sense -CD DISC: Focus unlocked at LD sense and locked at CD sense. -NO DISC: No focus lock at LD sense & CD sense</p>
<p>SPDL motor is not accelerated in LD mode.</p>	<p>-Resolder CN14 (RF IN) of VSOP.</p>	<p>P.27, B-1</p>	<p>Poor contact of CN14. As RF signal is not applied, ACCEL and BRAKE signals for SPDL servo are shifted to Low alternately. So, motor speed can't be accelerated.</p>	<p>[SPDL motor acceleration] 1) CPU (IC1 on VSOP) keeps ACC CONT signal High (+5V) until SPDL motor is accelerated to 360rpm, by counting FG frequency. When ACC CONT signal is High, CPU makes ACCEL signal Low (-5V) forcedly. 2) Till the frequency of RF signal reaches the specified value (8.5MHz), ACCEL COMP (IC403) keeps ACCEL signal Low. 3) SPDL servo is controlled so that H sync in reproduced video signal becomes 15.734KHz. (PA5010, TL8707P, PA9001 & PA5009 on VSOP) * In preceding models, SPDL motor has been controlled by using FG signal until the motor is accelerated to 1800rpm. Step 2) is skipped. * In CLD-3030, if RF signal is not applied, the operation can't proceed to Step 2). Then SPDL motor keeps rotating at a low speed (about 360rpm).</p>



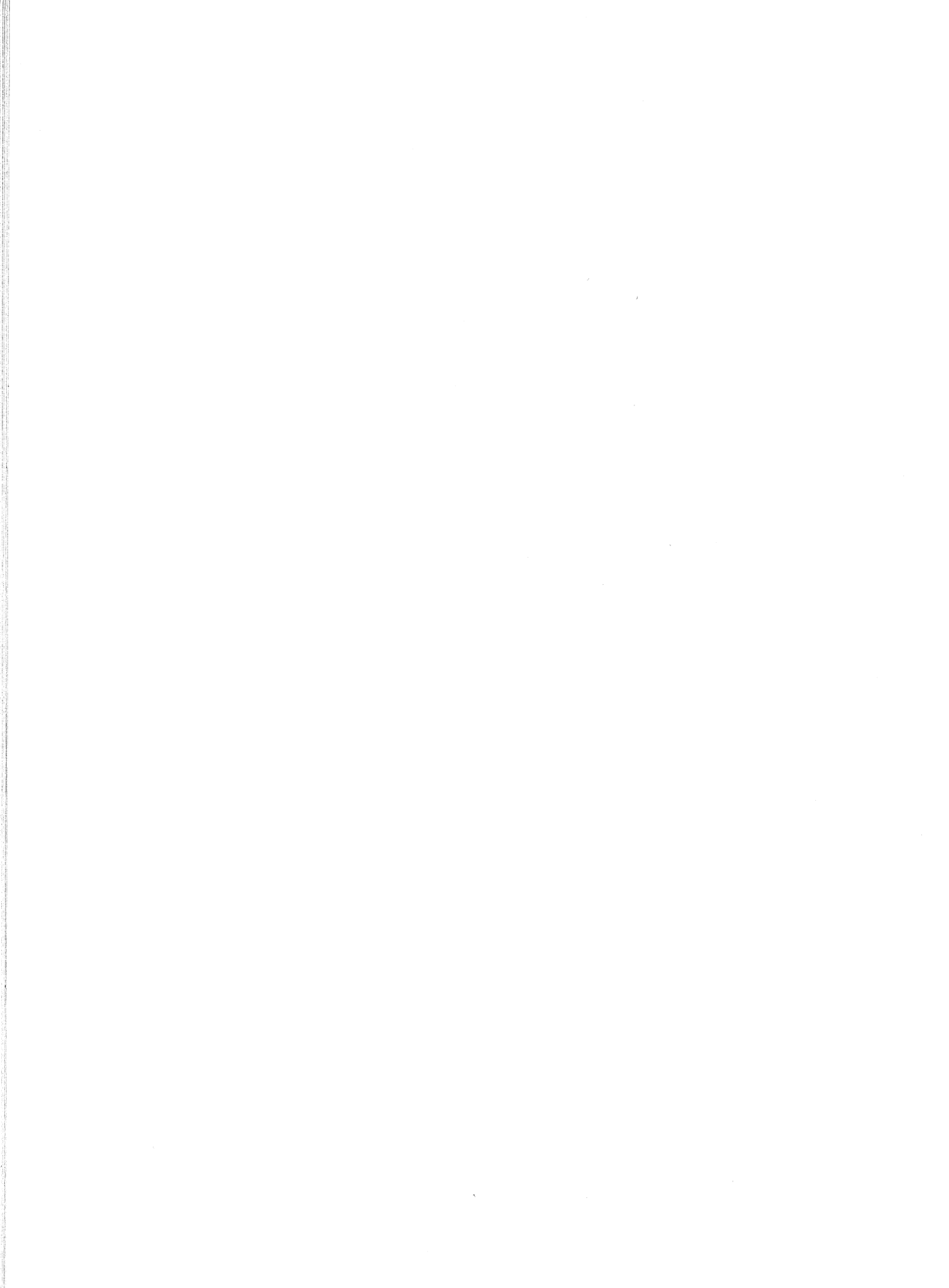
(See Fig.)

Problem	Countermeasure	S/M: ARP1559 P.28, A-4	Cause	Remarks
<p>No raster. (No SPDL servo lock)</p>	<p>-Replace CCD IC (TL8707P).</p>		<p>CCD IC failure. Video signal is not applied, and H sync for SPDL servo can't be extracted.</p>	<p>[CCD IC check method] *In preceding models, H sync is extracted from Video signal before the video signal is applied to CCD IC. The H sync is used to control SPDL motor. So, even if CCD IC is defective, SPDL servo can be locked. SPDL servo and CCD servo operate separately. Only ERROR for CCD servo is made from Video signal applied from CCD IC. *In CLD-3030, SPDL servo and CCD servo extracts H sync from the video signal applied from CCD IC to make ERROR signal. So, SPDL motor and CCD are controlled by using the same ERROR signal. If H sync can't be extracted, SPDL motor is controlled by using RF signal so that its speed reaches 1800rpm. So, observe the input and output signals of CCD IC (TL8707P) to check whether or not the IC is defective. -If the video signal is not applied from CCD IC, the IC is defective. -If the video signal is applied from the IC, SPDL servo or CCD servo is defective. [SPDL/CCD servo check method] -When the video signal is applied from CCD IC, switch off DIGITAL memory and turn off CCD servo as shown below. -If V & H sync are stable, CCD servo is defective. -If V & H sync are unstable, SPDL servo is defective.</p>

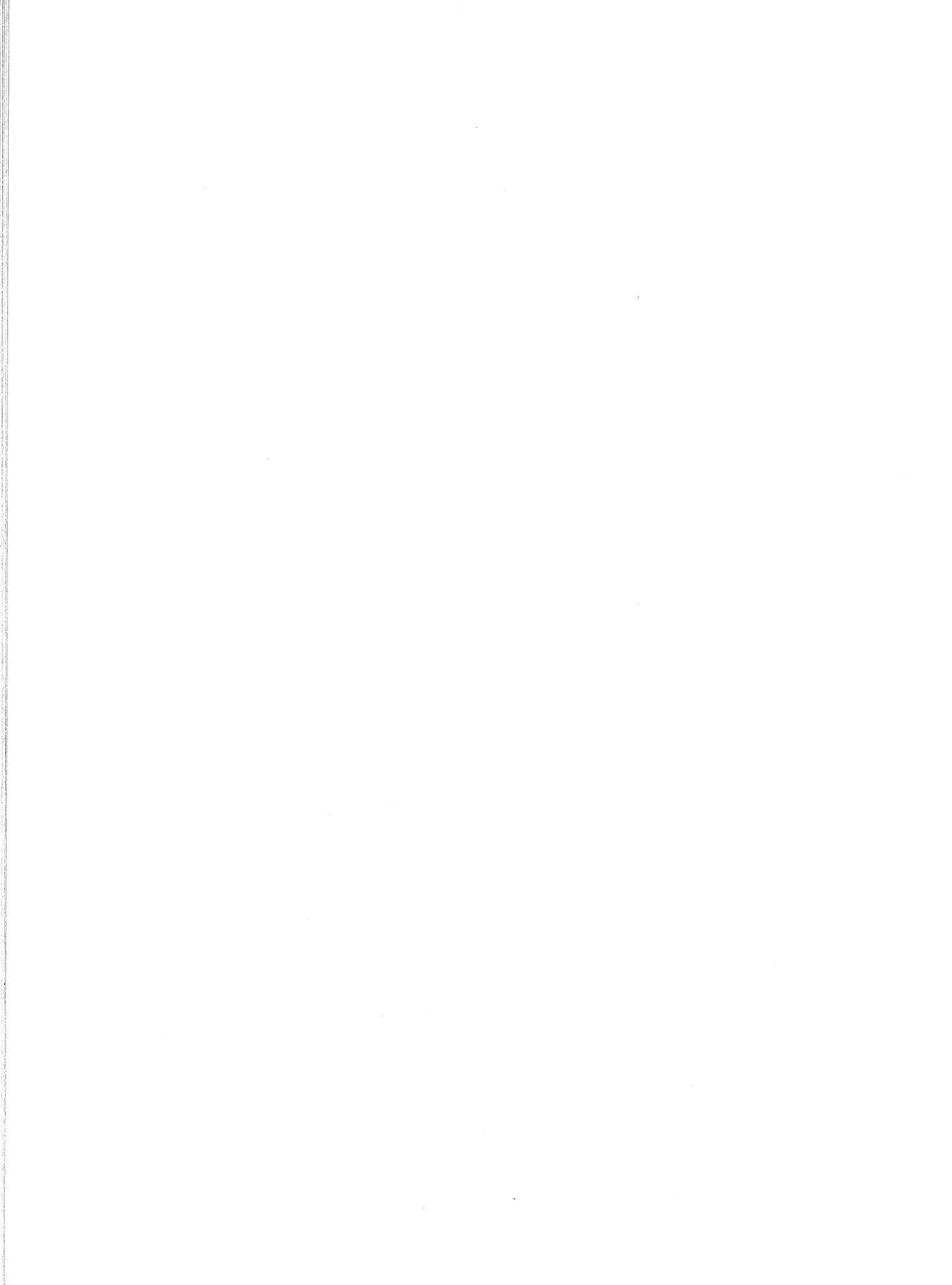


(See Fig.)

Problem	Countermeasure	S/M: ARP1559	Cause	Remarks
<p>Picture color becomes uneven after some-time play.</p>	<p>-Replace X101 (VSS1011, 3.58MHz) on VSOP (TBC CONT).</p>	<p>P.31, B-3</p>	<p>Poor thermal characteristic of X101. The oscillating frequency of X101 is a reference signal for Color phase compensator. It varies due to change of ambient temperature.</p>	<p>[X101 check method] -Observe PLL offset voltage at Pin-1 of IC103 on VSOP (TBC CONT) on an oscilloscope. -When Power sw is depressed, the offset voltage is 0V. -If it begins decreasing some time after, the thermal characteristic of X101 is defective. -Then it reaches around -0.5V, the waveform becomes noisy and picture color becomes uneven.</p> <p>0V ————— → ————— -0.5V ~~~~~</p> <p>*When X101 is heated up with a drier, the symptom may appear easier.</p>



Abbreviations



ABBREVIATIONS (1/8)

4FSC	---	4 Times Frequency of Sub Carrier (14.32MHz)
ABS	---	Absolute
ACK	---	Acknowledge
ADEM	---	Audio Demodulator
ADM3	---	Audio Demodulator number 3
ADMC	---	Analogue to Digital Converter and Memory Control
ADMP	---	Audio Demodulator for PAL
ADR	---	Address
AFC	---	Automatic Frequency Control
AFCO	---	Automatic Frequency Control Output
ALC	---	Automatic Level Control
ALGC	---	Algorithm Control
ANS	---	Answer
ANT	---	Antenna
APC	---	Automatic Power Control
APC	---	Automatic Phase Control
APCG	---	Automatic Phase Control Gate
APCO	---	Automatic Phase Control signal Output
APT	---	Aperture
ASY	---	Asymmetry
ATC	---	Automatic Threshold Control
ATT	---	Attenuator
AUDF	---	Audio and Filter board
AUDX	---	Audio and CX noise reduction circuit
BAL	---	Balance
BCD	---	Binary Coded Decimal
BCK	---	Bit Clock
BCLK	---	Bit Clock
BLDB	---	Brushless motor Drive Board
BLK	---	Black
BLMB	---	Brushless Motor Board
BLU	---	Blue
BOEN	---	Bus Output Enable
BUSE	---	Buffer Select
C21K	---	Clock pulse 2.1MHz

ABBREVIATIONS (2/8)

CAA	----	Constant Angular Acceleration
CADR	---	Current Address
CALB	---	Carry Loading Board
CAPB	---	Capacitor Board
CARG	---	Carriage
CAV	---	Constant Angular Velocity
CC	---	Conversion Command
CCD	---	Charged Coupling Device
CD	---	Compact Disc
CDDM	---	CD Demodulator board
CDM	---	CD Motor
CDSB	---	CD Sensor Board
CE	---	Chip Enable
CHAP	---	Chapter
CHB	---	Character Back
CHR	---	Character
CIN	---	Clock Input
CIRC	---	Cross Interleave Reed-solomon Code
CK2M	---	Crystal divider output 2MHz Clock pulse
CK4M	---	Crystal divider output 4MHz Clock pulse
CKSE	---	Clock Select
CLMP	---	Clamp (disc)
CLV	---	Constant Linear Velocity
CMD	---	Command
CN	---	Connector
CNKY	---	Connector and Key board
CNNB	---	Connecting Board
COFS	---	Correction Frame Sync output
COMP	---	Comparator
COMP	---	Compensator
CONST	---	Constant
CONT	---	Controller
CORR	---	Correction
COSV	---	Control and Servo Board
CPCB	---	Color Phase Compensator Board

ABBREVIATIONS (3/8)

CPU	---	Central Processing Unit
CRC	---	Cyclic Redundancy Check
CS	---	Chip Select
CTCB	---	Cross Talk Canceller Board
DACK	---	Data Acknowledge
DAPS	---	Digital to Analogue converter and Power Supply
DASD	---	Digital Audio Signal Display
DAST	---	Data Status
DB	---	Data Bus
DBIAS	---	DC BIAS
DCDR	---	Decoder Board
DCL	---	Discharge Left signal
DCR	---	Discharge Right signal
DEMB	---	Demodulator Board
DEMP	---	De-emphasis
DGTL	---	DIGITAL
DI	---	Data Input
DIRK	---	Display Infrared amplifier and Key
DISCRI	---	Discriminator
DISP	---	Display control board
DIVC	---	Divider Control
DMLD	---	Disc Motor Lock Detect output
DOC	---	Drop Out Compensator
DOS	---	Drop Out Sense
DRCT	---	Direction
DRVB	---	Drivers Board
DSDC	---	Digital Sound Demodulator and Control
DSLPL	---	Data Status Latch Pulse
DSPD	---	Display Drivers board
DSV	---	Digital Sum Value
ECL	---	Emitter Coupled Logic
EFM	---	Eight to Fourteen Modulation
EMPH	---	Emphasis
ERR	---	Error
ESGL	---	Error frame Select Gate LSB

ABBREVIATIONS (4/8)

ESGM	---	Error frame Select Gate MSB
FCS	---	Focus
FGIN	---	Frequency Generator Input
FL	---	Fluorecent tube
FLKY	---	Fluorescent and Key board
FMPB	---	Focus Motor Protection Board
FOCS	---	Focus
FSK	---	Frequency Shift Keying
FSLO	---	Frame Sync Lock
FSPS	---	Frame Sync Pattern Synchronizing
FTS	---	Focus servo, Tracking servo and Slider servo
FUSB	---	Fuse Board
FWD	---	Forward
GRN	---	Green
GRY	---	Gray
HD	---	Horizontal sync Drive
HDM	---	High Density Modulation
HEDA	---	Head Amplifier
HEPB	---	Head Phones output Board
HPJB	---	Head Phone Jack Board
HPVB	---	Head Phone Volume Board
INH	---	Inhibit
INIB	---	Initialized Board
INT	---	Interrupt
IRAB	---	Infrared command Receiver and Amplifier Board
IRE	---	Institute of Radio Engineers
ISET	---	Intergrated Set current
JSDL	---	Jog Shuttle Dial Board
KDCB	---	Keyboard and Display Control Board
KEYB	---	Key Board
L/RG	---	Left channel / Right channel Genelator
LD	---	Laser Diode
LD	---	Laser vision Disc
LDD	---	Laser vision with Digital sound Disc
Lddb	---	Laser Digital sound Demodulator Board

ABBREVIATIONS (5/8)

LDSB	---	Laser vision Disc Sensor Board
LEDB	---	LED Board
LIM	---	Limiter
LMCB	---	Loading Motor Calibrator Board
LMCB	---	Loading Motor Connecting Board
LOLB	---	Loading Logic Board
LPF	---	Low Pass Filter
LRCK	---	Left / Right Clock
LSB	---	Least Significant Bit
LSFB	---	Line Surge Filter Board
LSPS	---	Laser Power Supply
LV	---	Laser Vision
LVD	---	Laser Vision Disc
LVDD	---	Laser Vision with Digital sound Disc
MADC	---	Mechanical Assembly Drive and Control
MD	---	Monitor Detector
MDP	---	Motor Drive for Phase control
MDS	---	Motor Drive for Speed control
MLCK	---	MSB/LSB Clock
MMVB	---	Monostatable Multi-Vibrator Board
MODB	---	Modulator Board
MSB	---	Most Significant Bit
MTR	---	Motor
MUT	---	Muting
MWRE	---	Memory Write Request
NRZ	---	Non Return to Zero
NRZI	---	Non Return to Zero Inverted
ORN	---	Orange
OVRG	---	Over Run Gate
P/S	---	Play/Stop
P/S SE	---	Parallel/Serial Select
PADR	---	Pause Address
PALB	---	PAL Board
PB H	---	Playback Horizontal sync
PBFS	---	Playback Frame Sync

ABBREVIATIONS (6/8)

PCB	----	Printed Circuit Board
PCM	----	Pulse Code Modulation
PCSA	----	Phase Control Select A
PCSB	----	Phase Control Select B
PD	----	Photo diode Detector
PFCK	----	Playback Frame sync Clock
PHDB	----	Photo Detector Board
PLCK	----	Phase Locked loop Clock
PLL	----	Phase Locked Loop
PNJB	----	Pin Jack Board
POS	----	Position
POT	----	Potentiometer
PREB	----	Pre-processing Board
PROG	----	Program
PWM	----	Pulse Width Modulation
PWSB	----	Power Switch Board
QDA	----	Q-Data
QDAS	----	Q-Data Switching
QDRD	----	Q-Data Read
QDRE	----	Q-Data Read Enable
QDSE	----	Q-Data Select Enable
QDSS	----	Q-Data Sync Select
R/W	----	Read/Write
RAM	----	Random Access Memory
RAOV	----	RAM Overflow
RD	----	Read
RECB	----	Rectifier Board
REF H	----	Reference Horizontal sync
REGB	----	Regulator Board
REP	----	Repeat
RES	----	Reset
REV	----	Reverse
RF	----	Radio Frequency
RFAM	----	Radio Frequency Amplifier
RFCK	----	Read Frame Clock

ABBREVIATIONS (7/8)

RFMD	---	Radio Frequency Modulator
ROM	---	Read Only Memory
RTN	---	Return
S/H	---	Sample and Hold
S0S1	---	Sub Code S0 and S1
SADR	---	Search Address
SBCD	---	Sub Code output board
SC	---	Sub Carrier (3.58MHz)
SC	---	Sub Code
SCK	---	Sync Clock
SCPD	---	Sub Code P Detect
SCPT	---	Sub Code data P or T
SCQU	---	Sub Code data Q or U
SCRV	---	Sub Code data R or V
SCSE	---	Sub Code Select
SCSW	---	Sub Code data S or W
SD	---	Serial Data
SEG	---	Segment
SEP	---	Separator
SHPB	---	Shipping switch Board
SLD	---	Slider
SLDR	---	Slider
SLMB	---	Slider Motor Board
SPDL	---	Spindle Motor
SQ	---	Squelch
SRCB	---	System Remote-control Connector Board
SRVB	---	Servo circuit Board
STB	---	Strobe
STBC	---	Spindle and Time Base Corrector
STBP	---	Spindle and Time Base corrector for PAL
STBY	---	Standby
SUPPR	---	Suppressor
SVCT	---	Servo Control circuit
SWG	---	Swing
SWTB	---	Switch Board

ABBREVIATIONS (8/8)

SYPS	----	System Power Supply
TANG	----	Tangential
TBC	----	Time Base error Correction
TES	----	Test
TIMB	----	Tilt Motor Board
TMAX	----	Maximum Distance between Transitions
TMGS	----	TMAX detector Gate Select
TMO	----	TMAX detector Output
TMOE	----	TMAX detector Output Enable
TMWS	----	TMAX detector Window Select
TOC	----	Table of contents
TOGL	----	Toggle
TRAPE	----	Trapezoid waveform
TRIG	----	Trigger
TRKG	----	Tracking
TSS	----	Trapezoid Start/Stop
VCO	----	Voltage Controlled Oscillator
VCXO	----	Voltage controlled Crystal Oscillator
VDEM	----	Video Demodulator Board
VDMP	----	Video Demodulator for PAL
VDP	----	Video Disc Playback
VNRB	----	Video Noise Reduction circuit Board
VPS	----	Video Phase Shifter
VSOP	----	Video and Servo Organized Part
WCLK	----	Word Clock
WDCK	----	Word Clock
WFCK	----	Write Frame Clock
WHT	----	White
WR	----	Write
WSEG	----	Window Select Gate
YEL	----	Yellow

FIRST EDITION
FIRST PRINTING -1989

Compiled and edited by

Editors in Chief:
Sadahiko Yoshimine
General Manager
Customers Service &
Technical Information Department

Tadahiro Nakagawa
Manager
Technical Service Information &
Coordination Section

Editor:
Katsumi Nohara

Translator:
Michiko Kadoi



PIONEER ELECTRONIC CORPORATION

4-1, Meguro 1-chome, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS SERVICE INC.

P.O. Box 1760, Long Beach, California 90801, U.S.A.

PIONEER ELECTRONICS OF CANADA, INC.

505 Cochrane Drive, Markham, Ontario L3R 8E3, Canada

PIONEER ELECTRONIC (EUROPE) N.V.

Keetberglaan 1, 2740 Beveren, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY LTD.

178-184 Boundary Road, Braeside, Victoria 3195, Australia