# CLARION SERVICE MANUAL 4 CHANNEL IC CAR STEREO PLAYER

# DEL PE-424A

CLARION SHOJI. CO.

NEW KOJIMACHI BLDG., 3, 5-CHOME, KOJIMACHI, CHIYODA-KU, TOKYO, JAPAN. PHONE NO. 265-2931~4

USA BRANCH: CLARION SHOJI. CO., LTD. (U.S.A.)

2306 COTNER AVENUE, LOS ANGELES, CALIF., 90064, U.S.A. PHONE NO. 272-1178. 272-1169. 479-5556.

EUROPE BRANCH: CLARION SHOJI (EUROPA) G.m.b.H.

2000 HAMBURG 76, SCHÖNE AUSSICHT 35. GERMANY. PHONE: 2207667



## \* SPECIFICATIONS

8 track, 2 program, 4 channel Reproduction method: 8 track, 4 program, 2 channel

Automatic 4.2 Channel switching method: Tape speed: 9.5cm/sec.

Less than 0.3% Wow and flutter:

Greater than 24W (6W x 4) Maximum output:

12W (3W x 4) Rated output:

Less than 5% (at output of 12W Distortion factor:

[3W x 4]

S/N ratio:

Greater than 45dB Greater than 40dB Crosstalk:

Greater than 30dB Channel separation: Reproducing frequency range: 30Hz ~ 10,000Hz

Greater than 100dB Power amplitude:

Load resistance:

13.2V, negative ground Power supply voltage:

Current consumption: Less than 2A (at maximum output)

Less than 3A

(under pluger operation)

Operating temperature range:

2kg

Dimensions:

Weight:

Width 200mm

-20°C ~ +60°C

180mm Depth 55mm Height

Semiconductors used:

8 ICs 9 diodes TA-7063Px4 (IC)

TA-7092P x 4 (IC)

IS1555 x 8 10D4 x 1

Cartridges used:

8 track, 2 program, 4 channel 8 track, 4 program, 2 channel

FM cartridge

# \* COMPONENTS:

PA -4242-00	Main unit	1 Set
300-0490-00	Rear mounting bracket	1 Each
280-3040-00	Owner's guide	1 Each
921-5818-00	Parts bag	1 Set
852-4649-00	Extension lead	2 Each

# \* FEATURES:

# o Full use of monolithic ICs

Monolithic ICs are used extensively, allowing simplification of circuitry, compact construction and high stability.

## Automatic switching from 4 to 2 channels

Reproduction from 8 track, 2 channel cartridge tapes as well as 4 channel cartridge tapes is possible. Swithing is performed automatically due to the shape of the cartridge.

## Discrete 4 channel method

The discrete 4 channel method offers realistic reproduction giving an "on-stage" feeling.

# The unit is also adaptable for use a home stereo.

By using a power supply adaptor, this unit can be used as a 4 channel home stereo.

# Burglar alarm

A burglar alarm utilizing a key lock special bracket is furnished.

# FM cartridge

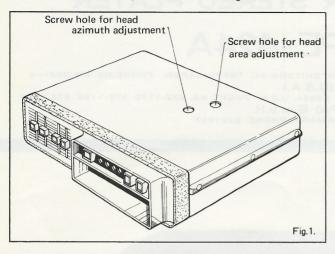
FM broadcasting can be received with an FM cartridge.

# Automatic repeating device

An automatic repeating device provides for continuous playing of the same program.

# \* ADJUSTMENTS:

The head section is precisely preadjusted at delivery time. If the adjustment is altered and crosstalk or tone deterioration occurs, readjust in the following manner. (Refer to Fig. 1)



## Head area adjustment (Use 2 channel tape)

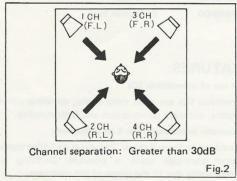
- 1. Balance left and right volume with the volume control knob.
- 2. Balance front and rear volume with the volume control knob.
- 3. Set the head position to  $2 \sim 6$  track (program indicator displays [2]). Using a test tape for the area adjustment, adjust to obtain the maximum output by turning the area adjustment screw.

### Head azimuth adjustment

- Set the head position to 2 ~ 6 track. Using a test tape for azimuth adjustment, adjust to obtain the maximum output.
- The azimuth adjustment may cause alteration of the area adjustment. Repeat the area adjustment and azimuth adjustment several times.

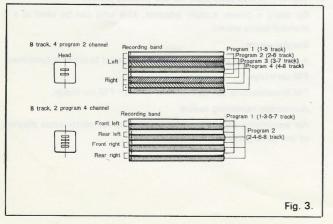
# 4 channel stereo

There are three 4 channel stereo systems; discrete, matrix and dummy. The discrete system is adopted for this unit. The discrete system is the leading 4 channel stereo system, providing clear separation and directivity to the audiance.



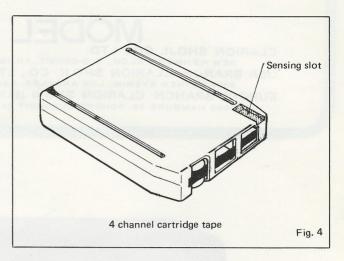
# Reproduction of 2 CH - 4 CH

Use recorded track combinations of 1-5, 2-6, 3-7, or 4-8 for a channel reproduction and 1-3-5-7 or 2-4-6-8 for 4 channel reproduction. (Refer to Fig. 3)



#### Switching of 2CH - 4CH

A sensing slot is provided on 4 channel cartridges as shown in Fig. 4. The switch on the mechanism is switched on by this sensing slot on the cartridge.



- Note 1: When replacing fuses, always locate and repair shorted points first. Replace with the designated 4A fuses.
- Note 2: The head is specially treated to be contamination proof.

  When the head is dirty, clean with industrial alcohol or carbon tetrachloride.
- Note 3: When replacing the flywheel, always insert the E ring or special washer.
- Note 4: Since this unit uses monolithic ICs, troubleshoot with special attention to the following points.
  - (1) IC pins are very close together. When checking these pins, be careful not to short them.
  - (2) A soldering iron may have an electric potential due to interior leakage. Use the iron only after grounding.
  - (3) Avoid making contact between IC circuits and large capacity capacitors when checking circuitry. The ICs may be broken due to the charging current.

# Note 5: Removal procedures for P.C.B.

Escutcheon

Remove the upper and lower cases. The Mechanism and P.C.B can be pulled out to get her.

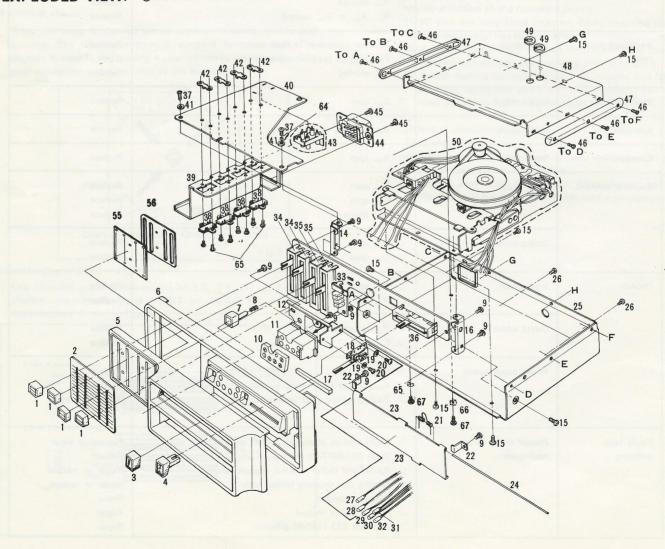
Sufficient lead wire is provided. Most repairs can be performed only by disconnecting the lead wire clamps.

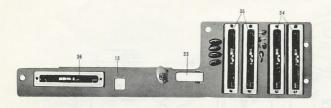
\*TROUBLESHOOTING MANUAL
For test points, refer to the attached circuit diagram (Circuit constants are diaplayed as shown in the FRONT LEFT SPEAKER).

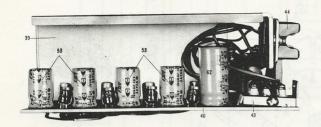
Symptom	Defective circuit	Defective point and cause	Corrective action	
No sound	Power supply circuit	○ Fuse blown	Replace	
		O Filter coil 010-0820-02	Replace	
		O Choke transformer 009-0570-00 open	Replace	
	19月日 - 日本日本	O Power supply switch 013-3097-00 defective	Replace ,	
	<b>20</b> 日	Faulty connector contact	Replace	
		Hot line parts of wiring open or shorted	Read just or replace	
	Output circuit	Speaker open or shorted	Replace	
	etQ septiment	Output coil 010-1657-00 open	Replace	
	6F	Output capacitor C <sub>114</sub> open		
	67	Output lead wire open or shorted	Replace	
	INTERNATION OF THE PARTY OF THE		Repair or replace	
		<ul> <li>○ IC<sub>102</sub> or mounting parts defective</li> <li>○ IC<sub>109</sub> or lead wire open or shorted</li> </ul>	Replace Repair or replace	
	MATERIAL PROPERTY AND ADMINISTRATION OF THE PROPERT	Date On Asset (200 Assets Assets (200 Asse	- Tropair of replace	
	Control stage	O Control circuit lead wire open or shorted	Repair or replace	
		C <sub>107</sub> or lead wire open or shorted     Volume control 012-3289-02 opened	Repair or replace	
		Volume control 012-3269-02 opened	Replace	
	Input circuit	O Load wire of dieds D. and D.	Replace	
		○ Lead wire of diode D <sub>5</sub> and D <sub>6</sub> open	Replace	
		O Head lead wire open or shorted	Repair	
	Motor section	Motor shorted or open	Repair or replace	
		O Choke transformer 009-5006-00 open	Replace	
		O Contact or mechanism of motor switch 013-3098-00	Replace	
	98. 98.0 10-0010 SW	defective		
Reproduced sound	Input circuit	Improper adjustment or low sensitivity of head	Readjst or replace	
evel low	and the same of the same	O R <sub>109</sub> open	Replace	
		O R <sub>103</sub> shorted	Replace	
	A STATE OF THE STA	O C <sub>105</sub> open	Replace	
		O R <sub>101</sub> shorted	Replace	
		O R <sub>104</sub> , R <sub>105</sub> or C <sub>106</sub> shorted	Replace	
nsufficient high	Input circuit	Improper adjustment of head azimuth	Danding	
one	mpat sirout	Film path on head contaminated	Readjust	
		R <sub>104</sub> shorted	Clean Replace	
nsufficient high tone	Output circuit	○ C <sub>112</sub> open		
Excessive low tone	Control of the Contro		Replace	
excessive low tone	Input circuit	$\circ$ R <sub>105</sub> and C <sub>106</sub> shorted	Replace	
Excessive low tone	Input circuit	O R <sub>105</sub> open	Replace	
Sound is distorted	Input circuit	O R <sub>104</sub> open	Replace	
		O C <sub>106</sub> open	Replace	
		O R <sub>109</sub> shorted	Replace	
	Output circuit	○ C <sub>113</sub> open	Replace	
		O C <sub>115</sub> open	Replace	
Oscillate	Input circuit	○ C <sub>108</sub> open	Dealers	
, oo mate	input on out	R <sub>109</sub> shorted	Replace Replace	
	Output gizavit	O. B. anistana standa	Boylo Sayes	
	Output circuit	<ul> <li>R<sub>108</sub> resistance changed</li> <li>C<sub>111</sub> open</li> </ul>	Replace Replace	
	\$250,000 pt 150			
	Power supply circuit	<ul> <li>R<sub>502</sub> shorted</li> <li>C<sub>503</sub>, C<sub>504</sub> or C<sub>512</sub> leaking or open</li> </ul>	Replace	
	TO THE PARTY OF	Fault grounding point screws loosened	Replace	
		T don't grounding point screws loosened	Replace or repair	
Faulty bood	Dhipman size it			
aulty head	Plunger circuit or	Faulty contact of plunger contact plate or open circuit	Replace or repair	
switching	mechanism	O Diode 001-0077-00 shorted	Replace	
		Rachet and rachet kick not engaging properly	Repair or replace	
	24	Sensing tape touching contact plate	Repair or replace	
		O C <sub>509</sub> , C <sub>510</sub> shorted	Repair	
		O Plunger layers shorted	Repair	
		O REP SW 013-1120-00 defective	Repair	
		The on old 1120-00 delective	Inchail	

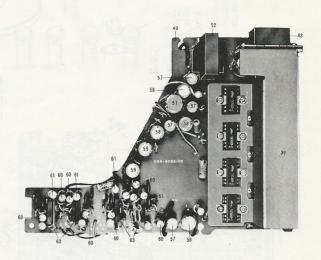
Symptom	Defective circuit	Defective point and cause	Corrective action	
Orosstalk	Head sift mechanism	Defective cartridge	Replace	
		○ Faulty area adjustment	Readjust	
Display lamp	Display lamp or	O Pilot lamp open	Replace	
defective	circuit	○○Lead wire open	Replace	
408 05		O Switch 013-3696-00 defective	Replace	
Abnormal wow	Cartridge with drive	Flywheel defective	Replace	
	mechanism	O Belt defective	Replace	
		Transmission mechanism cnntaminated with oil	Clean	
		O Capstan housing defective	Replace	
		Motor defective	Replace	
		O Cartridge defective	Replace	
aulty 4CH-2CH	Switching circuit	O Changeover switch 013-3696-00 defective	Replace	
switching		· CA capacitor shorted or open	Replace	
		O Change over switch 013-3639-00 installed out of place	Repair	
		O Rotary switch 099-4062-00 defective	Repair or replace	
No sound with	Power supply circuit	O Plunger circuit defective	Repair or replace	
radio cartridge		O Connector 074-0400-00 faulty	Repair or replace	
	Connection circuit	O Connector 075-0400-00 faulty	Repair or replace	
	to the sould be the sould be out the	O Switch 013-3097-00 defective	Repair or replace	
		O C <sub>115</sub> or circuit open	Replace	
	10 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	O Rotary switch 099-4042-00 defective	Replace	
	Antenna circuit	Lead wire from antenna receptacle 092-0400-01 badly soldered or open	Repair or replace	
	treet may cause alteral	Faulty contact of outlet socket	Repair or replace	

# **\*EXPLODED VIEW:** ⊙Main unit section





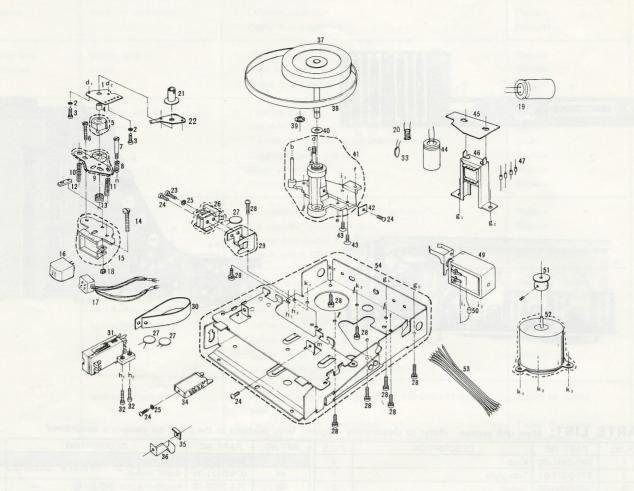




\*PARTS LIST: Main unit section (Refer to disassembly diagram: Grey portions in the parts list designate assemblies)

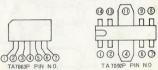
REF.NO.	PART NO.	DESCRIPTION	P.C.S	RFF.NO.	PART NO.	DESCRIPTION	P.C.
1	380-3361-00	Knob	4	43	944-0377-00	Filter assembly	1
2	371-2377-01	Trim plate	1	44	074-0471-01	Outlet socket	1
3	382-0060-00	Button	1	45	714-2606-10	Machine screw (M2.6×6)	2
4	380-3362-00	Knob	1	46	714-3008-43	Machine screw (M3×8)	6
5	370-2827-00	Escutcheon	1	47	383-0001-00	Decoration part	. 1
6	370-2828-00	Escutcheon	1	48	310-0767-01	Upper case	1
7	382-0059-00	Button	1	49	335-0618-00	Cap	2
8	750-1400-00	Spring	1	50	930-0405-24	Tape mechanism assembly	1
9	702-3008-10	Tap-screw (M3×8)	9	51	042-0152-00	Special capacitor (16V470µF)	2
10	375-0504-00	Pilot lamp accessory	1	52	009-0570-00	Choke	1
11	345-2385-01	Pilot holder	1	53	042-0153-00	Special capacitor (10V1000μF)	4
12	330-5005-00	Pilot holder mtg bracket	1	54	010-1657-00	Coil	4
13	099-4083-00	Printed wiring boad	1	55	345-2389-00	Rubber part	1
14	330-5004-00	P.W.B mtg bracket	1	56	330-5010-00	Pressed part	1
15	714-3004-19	Machine screw (M3×4)	6	57	170-3364-32	Electrolytic capacitor (16V33µF)	4
16	330-5004-01	P.W.B mtg bracket	1	58	170-1074-22	Electrolytic capacitor (10V100μF)	4
17	345-2389-00	Packing	1	59	042-0154-00	Electrolytic capacitor (10V220μF)	2
18	013-1120-03	Switch	1	. 60	170-1064-22	Electrolytic capacitor (10V10μF)	9
19	740-2000-20	Washer	2	61	170-1054-62	Electrolytic capacitor (50V1µF)	4
20	714-2003-11	Machine screw (M2×3)	2	62	042-0144-00	Special capacitor (16V1000μF)	1
21	750-1481-00	Spring	1	63	051-0011-00~04	IC	4
* 22	330-5009-01	Shaft lock mtg bracket	2	64	330-1570-00	Cord clamp	1
23	320-0178-01	Dust proof cover	11	65	732-3008-11	Sems screw	8
24	341-0590-00	Shaft	1	66	742-3000-20	Toothed washer	2
25	311-0821-02	Lower	1	67	714-3006-19	Machine screw	2
26	730-3006-19	Taptight	2		141-3333-12	Polyester capacitor (50V0.033μF)	4
27	017-0292-06	Pilot lamp	1		144-1013-14	Mica capacitor (100PF)	8
28	017-0292-07	Pilot lamp	1		111-3911-32	Film resistor (¼W390Ω±5%)	4
29	017-0292-08	Pilot lamp	1	R <sub>108,208,308,408</sub>	111-4701-32	Film resistor (¼W470Ω±5%)	4
30	017-0292-09	Pilot lamp	1	R <sub>502</sub>	111-3312-32	Film resistor ( $\frac{1}{4}$ W330 $\Omega$ ± 10%)	1
31	017-0292-04	Pilot lamp	1	R <sub>501</sub>	111-7112-32	Film resistor ( $\frac{1}{4}$ W710 $\Omega \pm 10\%$ )	85
32	017-0292-10	Pilot lamp	1	R <sub>107</sub> , <sub>207</sub> , <sub>307</sub> , <sub>407</sub>	111-3322-32	Film resistor ( $\frac{1}{4}$ W3.3K $\Omega \pm 10\%$ )	4
33	330-5006-00	Pressed part	1	R <sub>106,206,306,406</sub>	111-4722-32	Film resistor ( $\frac{1}{4}$ W4.7K $\Omega \pm 10\%$ )	4
34	012-3289-02	Variable resistor	2	R <sub>102,202,302,402</sub>	111-1032-32	Film resistor ( $\frac{1}{4}$ W10K $\Omega \pm 10\%$ )	8
35	012-3287-03	Variable resistor	2	R <sub>101,201,301,401</sub>	111-3932-32	Film resistor ( $\frac{1}{4}$ W39K $\Omega \pm 10\%$ )	
36	012-3320-00	Variable resistor	1	R <sub>103</sub> , <sub>203</sub> , <sub>303</sub> , <sub>403</sub>	111-1542-32	Film resistor ( $\frac{1}{4}$ W150K $\Omega \pm 10\%$ )	
37	714-3006-11	Machine screw (M3×6)	10	R <sub>105,205,305,405</sub>	111-3342-32	Film resistor (½W330KΩ±10%)	4
38	051-0010-00~05	IC	1	R <sub>503,504</sub>	111-1012-32	Film resistor ( $\frac{1}{4}$ W100 $\Omega \pm 10\%$ )	2
39	313-0831-00	Heat sink	1		170-1064-21	Electrolytic capacitor (10V10µF)	
40	099-4082-00	Printed wiring boad	1	C <sub>309</sub>	170-2254-60	Electrolytic capacitor (50V2.2µF)	1
41	746-0030-00	Special washer	2	C <sub>107</sub> , <sub>207</sub> , <sub>307</sub> , <sub>407</sub>	170-2254-62	Electrolytic capacitor (50V2.2µF)	7
42	330-4960-01	IC mtg bracket	4	201720170017401			

# \* EXPLODED VIEW: • Mechanism section



# \* MECHANISMS PARTS LIST:

REF.NO.	PART NO.	DESCRIPTION	P.C.S	REF.NO.	PART NO.	DESCRIPTION	P.C.S
1	099-4042-04	Printed wiring boad	1	28	732-3006-11	Sems screw (M3×6)	9
2	741-2000-21	Spring washer (M2)	2	29	960-2705-01	Tape guide assembly	1 1
3	714-2006-11	Machine screw (M2×6)	2	30	631-0076-00	Guide plate	1
4	632-0302-00	Sleeve holder	1	31	013-3097-00	Switch	1
5	960-2732-00	Ratchet assembly	1,	32	714-2308-11	Machine screw (M2.3×8)	2
6	715-3010-01	Machine screw (M3×10)	1	33	165-3934-02	Ceramic capacitor	1
7	716-0212-01	Special screw	1	34	013-3096-00	Switch	1
8	750-1403-00	Spring	1	35	630-0518-00	Plate	1
9	960-2759-00	Cam assembly	1	36	750-0519-00	Spring	1
10	750-1411-00	Spring	1	37	611-0020-01	Flywheel	1
11	750-1410-00	Spring	1	38	602-0019-00	Belt	1
12	631-0090-00	Spacer	1	39	743-4000-00	E-Ring (M4)	1
13	750-1475-00	Spring	1	40	746-0620-00	Special washer	1
14	715-2308-61	Machine screw (M2.3×8)	1	41	960-2833-00	Housing assembly	1
15	960-2799-00	Head clamp assembly	1	42	630-0612-00	Tape protector	1
16	011-0220-00	Head	1	43	714-3006-41	Machine screw (M3×6)	2
17	852-4629-00	Extension lead	1	44	180-4774-32	Electrolytic capacitor	1
18	722-0311-00	Special nut	1	45	099-4085-03	Printed wiring boad	1
19	180-1084-32	Electrolytic capacitor	1	46	009-0583-01	Choke	1
20	010-1657-00	Coil	1	47	001-0081-00	Diode	4
21	631-0089-00	Area adjustment nut	1	48			-
22	630-0713-01	Rotary plate	1	49	015-0190-02	Plunger	1
23	714-2608-11	Machine screw (M2.6×8)	1	50	001-0077-00	Diode	1
24	714-2606-11	Machine screw (M2.6×6)	1	51	603-0022-00	Motor pulley	1
25	741-2600-21	Spring washer	2	52	960-1970-02	Motor assembly	1
26	960-2755-00	Socket assembly	1	53	816-0074-00	Special lead	1
27	043-0022-00	Special capacitor (0.04 µF)	3	54	960-2760-04	Deck plate assembly	1



Note) 1 . C<sub>507</sub> - C<sub>510</sub> : 043-0022-00 2 . C<sub>5030</sub> C<sub>544</sub> : 042-0152-00 3 . C<sub>5030</sub> C<sub>542</sub> : 042-0154-00 4 . C<sub>1140</sub> C<sub>2140</sub> C<sub>3140</sub> C<sub>414</sub> : 0

. C<sub>359</sub>, C<sub>359</sub>, C<sub>42</sub>, C<sub>314</sub>, C<sub>42</sub>, 042-0153-00 . D<sub>1</sub>~ D<sub>4</sub>; 001-0081-00 (IS1555) . CT<sub>1</sub>~ CT<sub>5</sub>: 944-0377-00

7 . PL,~PL,: 017-0292-07~10 8 . PL, PL,: 017-0292-04, 06

9. All unspecified resisters are 1/4W±10%.
10. Fuses should be 4A.

II. C<sub>512</sub>: 042-0144-00

Note) The preamplifier power supply is switched ON-OFF alternately by means of a rotary switch when a cartridge tape is inserted, Verify the switching action using a 4 channel cartridge tape.

tester used: Internal resistance  $4K\Omega/V$ 50V range for over 10V 10V range for over 2.5V 2.5V range for under 2.5V

Note) When a measurement is made in a range other than specified, the measured value may be slightly different.

