Clarion Co., Ltd

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Clarion Service Manual



AM/FM STEREO
CASSETTE RECEIVER
Model 8203R
(PE-9510A)

SPECIFICATIONS:

(The specifications for this product were determined and are presented in accordance with specification standards established by EIA)

General

Power supply voltage: DC 14.4V

(10.8 to 15.6V allowable)

Current consumption:

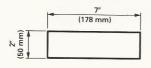
Less than 3A

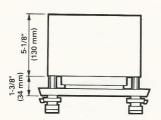
Load impedance:

4 ohms.

(4 to 8 ohms. allowable)

Dimensions:





POWER AMPLIFIER

120µs(normal):

AM Section

Tape Section

Wow & Flutter:

Stereo separation:

Tape speed:

Frequency range:

Usable sensitivity.(20dB S/N): 20µV

Signal/Noise ratio: 53dB Norm(120us)

Maximum Power Output:

Frequency Response(± 3dB)

Continuous Average
Power Output:

12W Total(6W/ch.)
3.2 W/ch.

4ohms, 50Hz to 20kHz at 1% THD

530kHz to 1710kHz

4.76cm/s.(1-7/8ips)

30Hz to 14kHz

0.1% W.R.M.S.

45dB at 1kHz

PRE-AMPLIFIER

Tone(@ 10kHz) Action: −10dB

FM Section

Frequency range:

87.9MHz to 107.9MHz

Usable sensitivity:

12dBf

50dB Quieting sensitivity:

:

Alternate channel selectivity:

17dBf

Stereo separation:

70dB 35dB at 1kHz, 60dBf input

Frequency response:

30Hz to 15,000Hz, +3dB

COMPONENTS:

• 8203R(PE09510A-A)

Main unit		1
Bracket, rear MTG	B2002213900A	1
Gasket, nose piece	B2006703500A	1
Extention lead	E2004017800B	1
		1
Escutcheon	B2001502500B	1
Parts bag	B2009601100B	1
(Knob Inner(Built-in	B2001251800A	(2)
Spring)		
Knob outer	B2001230500B	(2)

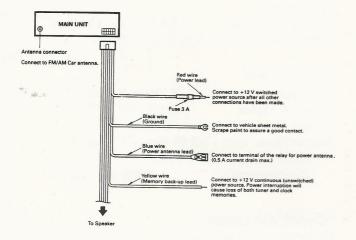
Parts bag	B2009601100B	1
(Screw, Tapping	M12115015012	(1)
Clip Install	B2007401000A	(1)
Stud Install	B2006302700A	(1)
Washer, Plain	M51100050012	(1)
Nut, Hex	M31200050012	(1)
Nut, Hex	B2009200300A	(4)
Washer Flat	B2009100701A	(4)

FEATURES:

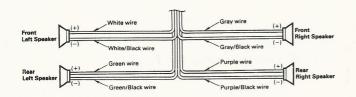
■ Electronic Quartz-Locked PLL Tuning ■ 12 FM/6 AM Touchbutton Memory ■ Seek Up/Down Tuning ■ Preset Station Scan (PS) ■ Automatic Station Stroe (AS) ■ 1710 kHz Expanded AM Band ■ Switchable Frequency Spacing Tuner ■ Auto DX/LO ■ Dual Gate FET/Balanced Mixer FM Front End ■ Signal Actuated Stereo Control (SASC) ■ Optimum IF Filter ■ Soft Muting ■ Auto Reverse with Dual Azi-

muth Adjustment ■ Locking FF/REW ■ Electronic Bridge Servo Motor ■ Hard Permalloy Tape Head ■ Illuminated Tape Door ■ Max. Power Output 12 Watts (6W/Ch) ■ Tone Control ■ 4-Way Balance Controls ■ LCD "Full Information Display" ■ Digital Quartz Clock ■ Night Illumination ■ Power Antenna Activator ■ Compact Chassis (7"×2"×5-1/8")

WIRE CONNECTION:

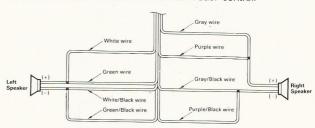


4-SPEAKER INSTALLATION



2-SPEAKER INSTALLATION

* This connection disables Front/Rear Fader control.



IMPORTANT

Improper installation may cause damage to your unit or car. If you do not have appropriate experience, use a qualified installer. Cutting chassis leads voids warranty.

- Connect wires together securely for good contact. Insulate any exposed wires with tape.
- 2. Use 4 to 8 ohms impedance speakers.

■ OPERATION GUIDE:

If you are driving in an area where you are unfamiliar with available stations, your radio will AUTOMATICALLY program the preset memory (SA) BROTC NOITATS DITAMOTUA

MOTOWARTICEST, PROS. AND THEN THAN TWO Press the PS button for MORE THAN TWO SECONDS and Auto Store will be activated. The Tuner will start to scan the band from the lowest frequency and will store SIX Storong stations as and FM2 may be Auto Stored separately.

SCAMMING. HE SIX STRIONS ARE NOT AVAILABLE YOU OTS OT NIADA NOTTUB SY HIT SSARY TSUM

томе сомтвог кмов

Turn clockwise to emphasize the treble response and counterclockwise to emphasize the bass re-

esuods

or the stations stored in the touch-button memory. Press this button to activate Preset Station Scan.

This will instruct the tuner to briefly tune into each of the stations stored in the fourth button moments. PRESET STATION SCAN (PS)

band (6 STATIONS) and then the FM2 (6 STA-Each station will be heard for approximately FIVE seconds. The raid of hea kip to the next preset position, and so on. When you activate PS when using the FM band, the tuner will scan the FMT has a so on.

you decide upon. again or press the appropriate preset button that STOP scanning, press EITHER the PS button (SNOIT

IF A PARTICULAR PRESET BUTTON IS PRO-CRAMMED FOR A STATION WHICH IS NOT RE-CEIVABLE IN YOUR AREA, THE TUNER WILL BYPASS THAT PRESET POSITION.

CASSETTE TAPE DOOR

I UTA CIOCKWISE TO SWITCH UNIT OR AND INCREASE VOLUME. POWER SWITCH/VOLUME CONTROL KNOB

Pull the knob toward you and lock into position. Adjust sound balance of left and right speakers for best stereo image. Depress the knob slightly to return to the volume mode. BALANCE CONTROL

Depress the button to stop play and eject the cassette. **EJECT BUTTON**

(4-sbegket system) **ЕА**DER СОИТВО**L** КИОВ

and rear speakers Adjusts the volume between front

M.T EMIS REEK CONTROL CONT 0 Ø ₹ ● DN/VOL pulBAL OFADER

To advance the tape at high speed, depress the button whose arrow is in the SAME direction as the tape play arrow in the display. FF/REW/TAPE PROGRAM BUTTONS

arrow in the display. arrow in the display.

To rewind the tape at high speed, depress the button whose arrow is in the OPPOSITE direction to the tape play

Lightly press the opposite button to release FF or REW. TO STOP FF OR REWIND ACTION

display will light to show the new tape direction. Depress both FF and REWIND buttons simultaneously to play the reverse side of the tape. The other arrow in the **SNOTTUR MARDORY 39AT**

Turn the control to the left to tune down the band. Turn the control to the right to tune up the band. UP/DOWN TUNING CONTROL

> During the time display, press and hold the "CLK" Press this button for momentary TIME or FREQUEN-CY display. To change Display Priority, see instruc-tions under "DIGITAL DISPLAY" section.

1) Select the desired station to be stored by either Seek ory for future recall. to 12 FM and 6 MA Stations may be stored in mem-

12 FM and 6 AM TOUCHBUTTON MEMORY

hear the station again, it has been stored into Memory. In the display, an indication corresponding to the touchbutton you have pressed will be displayed. or Manual Tuning.

Speez the desired touchbutton for MORE THAN TWO SECONDS. Sound is muted temporarily. When you have not a speed to the peop stoked into More.

SELECTED. TIONS ON FM2. PRESS THE BAND SELECTOR TO SELECT BETWEEN FM1 AND FM2. A BAND INDICATION WHICH BAND HAS BEEN SELECTOR. YOU MAY STORE 6 STATIONS ON FM1 AND 6 STA-

Clock Time Displayed For momentary Tuner Frequency display, press the TAME MODE: Clock Time Displayed of the Displayed. Dutton. (Frequency Display Priority). Frequency Displayed. For momentary Clock display, press the "CLK" ENCY/CLOCK DIGITAL DISPLAY FM2 INDICATOR FM1 INDICATOR CISTION EWIS CHEEK .1S **4** PRESET CHANNEL INDICATOR SEEK INDICATOR FM STEREO INDICATOR AOTACIQUI MARBORY 39AT FREQUENCY/CLOCK DIGITAL DISPLAY

instruct the tuner to go to the next frequency on the band. In the SEEK Tuning mode, the UP/DOWN Tuning Control will instruct the tuner to go to the next receivable station on the band.

Press this button to select the Manual or Seek Tuning mode. SEEK will appear in the display when the tuner is in SEEK mode. In the MANUAL Tuning mode, the UP(DOWN Tuning Control will

Press this button to select between AM, FM1 and FM2. When selecting an FM band either FM1 or FM2 will appear in the readout.

button.

Then turn the Tuning knob clockwise to set the mi-

TUNING MODE SELECTOR

AM/FM1/FM2 BAND SELECTOR

TIME SETTING

CLOCK SELECTOR

Vour new Clarion unit has been engineered to allow you to change the display priority from fadlo frequency loClex flow while in the readen onde. This unit is set for frequency Display Priority at time of shipment. The unit is set for frequency Display priority at time of shipment press she for the condition and then there is "Thing Mode" button subsequently from "Thing Mode" button subsequently. The "Thing procedure. To change back to Frequency Display Priority, repeat this procedure.

Automatic Distance/Local Circuit

Veluconatically adjust sure FM receiver sensitivity for ideal reception based on
the signal strength of both the desired and nearby station.
This is a new FM circuit using a Dual Gate FET/Balanced Mixer which effectively reduces interference distortion from nearby strong radio signals.

Signal Actuated Stereo Control (SASC)
 This circuit conveniently monitors weak stereo FM signals for optimum reception. When the stereo signal falls below the level of noise-free reception, when the stereo signal falls below the level of noise-by changing gradually SASC adjusts the tuner to reduce objectionable noise by changing gradually from stereo to mono mode and reducing high frequency response.

 $3.\,$ 1710 (kHz Expanded AM Band This unit comes integrated with a new tuner that can receive stations up to 1710 kHz.

4. Switchable Frequency Spacing The linitial setting from the factory is 10 kHz step for Exa. $_{\rm Exa}$

The way of the continental U.S. use, you can switch the frequency step and frefor ourside Continental U.S. use, you can switch the frequency snape by the following procedure.

I. While the tuner is ON, press five BAND selector and hold it.

2. Then turn the tuning knob counterclockwise.

3. Repeat above 1 and 2 to return to original setting.

zHM 6.70f of 8.78 zHM 6.701 of 6.78 FREQUENCY RANGE 100 KHZ 200 KHz FREQUENCY SPACING ЬM 231 to 1629 kHz 230 to 1710 kHz FREQUENCY RANGE ZHX 6 AM FREQUENCY SPACING

DNITTAL SETTING

Note: YOU WILL LOSE STATIONS IN THE PRESET MEMORY WHEN YOU SWITCH FREQUENCY SPACING.

5. System Upgrade Flexibility
Your unit will work with improved speakers, equalizers and power amplifiers
offered by Clarion. Ask your dealer for technical information on these items to
expand your listening enjoyment.



NEW SETTING

CASSETTE PRECUTION NO CARE:

- Slack tape can cause operating difficulties. Remove tape slack before inserting cassette, particularly when using C-90 or pre-recorded cassettes.
- Use C-30 to C-90 cassettes. Avoid use of C-120 or longer cassettes. (The very thin tape may stretch or break)
- Clean head periodically with good commercial head cleaner. Avoid touching head with magnetic or hard objects.
- Don't oil the cassette mechanism.
- Always remove cassette from mechanism when not in use. Exposure to direct sunlight, extreme temperatures or high humidity may damage cassettes.



TROUBLE SHOOTING GUIDE:

Good ground connections eliminate most electrical noise problems and require tight contact with the metal vehicle chassis. Remove plastic, paint or rust for good electrical contact.

Symptom	Possible cause	Solution
No power	Blown fuse	Replace if blown with same rating (3amps)
	Bad power connection	Securely connect leads
No sound	Misadjusted balance	Check balance control
one channel	Damaged lead or speaker	Interchange left and right channel speaker leads if no sound from other side, check or replace speaker
		wire. If no sound from same side. replace speaker
Noise, Alternator whine	Weak Battery or low fluid	Replace battery if weak or add fluid
(Radio and Tape)	Corroded battery posts	Clean posts for good contact
	Poor filtering	Add filter in power lead to unit
Noise, Pulse (Radio only)	Antenna location wrong	Move antenna away from noise source
	No factory noise suppression	See car dealer or note below
Poor reception	Insensitive windshield ant.	Replace with good sensitivity whip antenna
No memory or wrong time	Memory back up lead (Yellow wire) not energized	Connect to battery or continuous power source

All Clarion units are tested for electrical noise rejection during manufacture.

Electrical noise can be a vehicle systems problem. See a professional installer or your Clarion dealer for assistance in noise suppression techniques and-filter accessories.

MADJUSTMENTS:

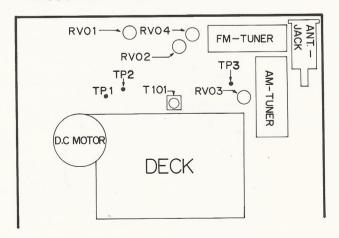
AM Circuit

Item	Input	Frequency	Output	Method of adjustment	Instruments required	Remark
• IF • Tracking						

• FM Circuit

Item	Input	Frequency	Output	Method of adjustment	Instruments required	Remark
			TP1	Connect a digital voltmeter to	Digital voltmeter	
OV		98.1MHz, 55EMF dBµ	TP2	TP1 and TP2 adjust IFT T101 to OV	• SSG	
			Meter across	Adjust RV03 so that left and right	MPX ST	
Separation		98.1MHz, 55EMF dBµ	the speaker	Separation becomes maximum and	• S.S.G	
		Modulation 100%	Voice Coil	the L, R outputs become equal.	• V.T.V.M	
307	Antenna	(0	TP3	Connect a frequency counter	MPX Stereo SG	
19KHz	recept		11.2	to TP3 and adjust RV04 to 19kHz	• VTVM	
	-acle	Set to the specified		Set the output level OdBm	Stereo SG	
		modulation(30%). assu-	Meter acress	(=0.775V) using the volume control.	Oscilloscope	
S.A.S.C		ming an FM SSG output	the speake2	 Set the FM SSG output to 	• V.T.V.M	
		65dB(98.1MHz) modulation	Voice Coil	38dB and adjust RVO2 so that	Frequency SG	
		frequency 6.3kHz		the output level is 2dB down		
Seek stop		Tune at 98.1MHz and input a		Adjust RV01 so that voltag of IC8129Z	• SSG	
sensitivity		19dB(non-modulated) SSG	U101 ⑦ piň	7 PIN is ov→5V, when SSG signal	Digital voltmeter	
(SD)		signal		is 25dB		

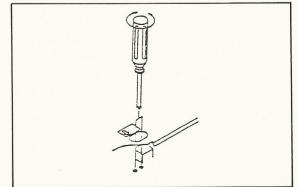
ADJUSTMENT POINT



TAPE MECHANISM:

Head-azimuth Adjustment

Make playback for the azimuth-tape (8kHz, -10VU), and turn each azimuth-adjusting screw to make each FWD & REV maximum. After adjustment, make adhesion with bond.





EXPLANATION OF IC'S

MA 3511AJ■

Outward Form

Performance

- XIM
- OSC(With ALC)
- olk amp.
- o Detector
- o AGC(Normal)
 ODA bned-binv 78
- Local oscillation buffer output.

Maximum Ratings (Ta = 25C)

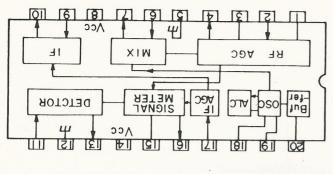
Wm	730		P _d max	Power Dissipation
٨	9.3	9 ni9	1	Input Voltage
٨	24	er.7 .oV ni9	ο Λ	Output Voltage
٨	91	Pin No. 8.14	xsm ₂₅ V.	Supply Voltage
tinU	Rating	noitibno	lodmy2	mətl

Electrical Characteristics

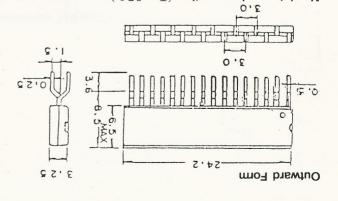
 $(T_a = 25 C, V_{cc} = 8V, f_r = 1 MHz, f_m = 400 Hz)$

Image Erequency Interference	A.MI	$\mathfrak{t}^i=\mathfrak{j} \ \text{400KH}^{\underline{v}}$		0.28		99
1F Interference	R.31	f _r = 600KHz		B.TT		gp
Output	$V_{SM(2)}$	130dBji input	3.E	0.8	g.7	٨
Signal meter	VSM(1)	Quiescent		0	£.0	٨
Total Harmonic Distortion	GHT	NadBµ input 30%mod		6.0	0.1	%
OiteR asioN of lengio	N/S	bom%0£ 1uqni ц8b47	0.18	0.98		ВÞ
Detection Output	∧ ₀ (2)	N4dBµ input 30%mod	0.21-	0.21-	0.6 -	mgp
	(1) ⁰ A	bom%0£ tuqni ulaba1	m8b 0.12- 0.22- 0.62-			
mətl	Symbol	SnothbnoO	niM	dγΤ	xsM	tinU

Block Diagram



■KIA 8129Z FM IF



Absolute maximum ratings(Ta=25C)

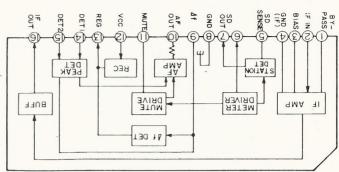
Tuning Indication Current	xem 1	70	Am
Power Dissipation	σЧ	097	Wm
Supply Voltage	^cc ∧	91	٨
mətl	Symbol	Rating	tinU

Electrical Characteristics

 $(V_{cc}\!=\!8.5V,~f_i\!=\!10.7MHz,~D_{ev}\!=\!+75kHz,~f_m\!=\!400Hz)$

	†WS∧	V=100dBµ	4.8	3.9	8.9		
Output	EMSA	ηab07=,V	9.2	8.8	ſ	۸	
Signal Meter	ZMSV	\\ = 20qBh	6.0	g.1	2.5	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
	IWSA	V=OdBµ		0	6.0		
oitsA noitsejeA MA	AMA	%0E=MA		99		ЯР	
Signal to Noies Ratio	N/S		1L	87		Вb	
OitsA noitrotaiQ	alli	RD=1.3KΩ		40.0	6.0	0/	
Total Harmonic	QHT	DeV = + 22.5KHz		100	90	%	
Detection Output	αοV		320	430	099	ц В b	
Limiting Sensitivity	(mil),V			33	35	ц <mark>а</mark> р	
mətl	Symbol	znoitibno teaT	niM	dγT	xsM	tinU .	
I) G LANG (Hango – IA					• •		

Block Diagram

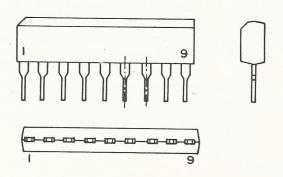


KIA8125S DUAL

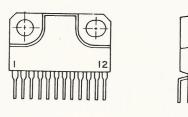
DUAL PRE-AMPLI-

■KIA7299P 5.8W×2CH POWER

Outward Form



Outward Form



Maximum ratings(Ta=25°C)

Item	Symbol	Rating	Unit
Supply Voltage	V _{cc}	18	V
Power Dissipation	P _D	700	mW

Maximum ratings($Ta=25^{\circ}C$)

Item	Symbol	Rating	Unit
Supply Voltage	V _{cc} opr	18	V
Power Dissipation	P _D .	25	W

Electrical Characteristics

 $(V_{cc}=6V, f=1MHz, R_{a}=600\Omega, R_{L}=K\Omega, Ta=25C)$

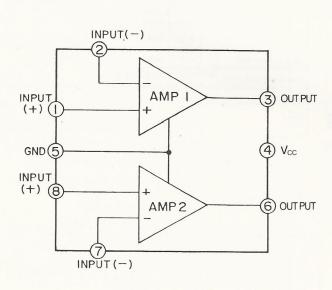
(Tee 0 v, 1 1101112, 11g	00012,	112 142, 14-250)				
Item	Symbol	Condition	Min	Тур	Max	Unit
Voltage Gain	GVo	VouT=-100dBm	75	100		
	GTv	VouT=-OdBm	38	41	44	dB
Channel Separation	CU and	f=10KHz, Vout=0dBm		65		dB
	CH spe	Vout=0dBm		05		uB
Total Harmonic Distortion	THD	.Vout=0dBm		0.04	0.25	%

Electrical Characteristics

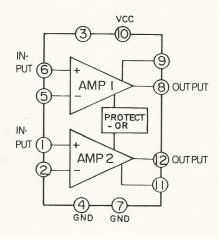
 $(V_{cc} = 13.2V, R_L = 4\Omega, R_g = 600\Omega, f = KHz, T_a = 25C)$

Item	Symbol	Condition	Min	Тур	Max	Unit
Output Power	Pout	THD=10%	5	5.8		W
Total Harmonic Distortion	THD	R _{OUT} =01W		0.06	0.3	%
Voltage Gain	G _V	V _{OUT} =0dBm	50	52	54	dB

Block Diagram



Block Diagram



Terminal Connection Table

2000. CO. 25.00. CO. 2					
7.2. COOD. 7. COOD. 7. COOD. 7. COOD. 7. COOD. 8. COOD. 9. C		"L" Controlled output. OFF			
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200. COUD. Choracter of the control		eoS) mod suqtuo lengis bellostnoo OAA ne si sidT (T)			
COODS (1999) CO		Γ., • WM			
20. COCOS. CO		"H" FM	(JAA)		
2000. COOD. 100. COOD.				QNA8	31
7.2. CDS. 7.3. CDS. 7.3. CDS. 7.3. CDS. 7.3. CDS. 7.4. CDS. 7.4. CDS. 7.5. C		"L" · Mute, OFF			
7.4. CDD4. 7.5. CDD2. 7.6. CDD4. 7.6. CDD4. 7.6. CDD4. 7.7. CDD5. 7.6. CDD4. 7.7. CDD5. 7.7. CDD5. 7.7. CDD5. 7.7. CDD5. 7.7. CDD6. 7.7. CDD6. 7.7. CDD6. 7.7. CDD6. 7.7. CDD6. 7.7. CDD6. 7. CDD7. 7. CD		NO ,91uM →(H"			
73. CCD3. 74. CCD4. 75. CCD3. 76. CCD4. 76. CCD4. 77. CCD5. 78. CCD5. 79. CCD5. 79. CCD5. 79. CCD6. 79. CCD6. 79. CCD7.		thee turature learning poritions a si sidT (T) (R)	DNITUM		66
1975 1975		signal source of the key matrix.			
10. CCD3. 10. CCD4. 10. CCD5. 10. CCD5. 10. CCD6. 10. CCD6. 10. CCD7. 11. CCD6. 12. CCD7. 12. CCD7. 12. CCD7. 12. CCD7. 13. CCD7. 14. CCD6. 15. CCD7. 15. CCD7. 15. CCD7. 16. CCD7. 17. CCD7. 18. CCD7. 18. CCD7. 19. CCD7. 19. CCD7. 19. CCD7. 19. CCD7. 19. CCD7.		This is a 4-bit output, it is used as the key return	Scan Out		52-58
10.023 - C.D.23 - C.D.33 - C.D.34 - C.D.35 - C.D					
17-25 CODS. 17-26 CODS. 17-26 CODS. 18-26 CODS. 18-26 CODS. 28-26 CODS. 29-26				(K4=PAO)	
10. CD23 - CD23	ınduı	external key matrixes.			tr7=07
10.023 - CO.23			Kow		20-24
19. Some of the control of the contr		(+H			
17. CDC CDC CDC CDC CDC CDC CDC CDC CDC CD		(T) An input port for the tape tuning indicator display.			
20. CCCOO. 20. Common and the commo			(())	IV.	
10. CCD. 2. CCD. 3. CCD. 4. CCD. 5. CCD. 5. CCD. 5. CCD. 5. CCD. 6. COMPT. 6. CCD. 6.	Indul				61
23-25 (2002) 24-25 (2002) 25			13	IAIT2	01
10.20 (2002) 2.50 (2002) 3.50		(T) See(T),(2) and Momentary Sw. No. (3) on			
1-4. CLD23- 2. CLD3-		tuqni d≥ oN •"1"			
1-4. CDM2- COM2. COM2. COM2. COM3. COM2. COM3.			(0-700)	7₩.1	
1-4. CDM2- COM2- COM3- C	Indul	Lise US for thorn the (h) (20 p old w. You profit and (h)			81
1-4. CDM2- C		1 30 7 . (0)		14100	
1-4. CDM2- COM2- COM3-					
25-20 CDMS CDM					
1-4. CDOMS COMM					
1-4. LCD4-LCD3-LCD3-LCD3-LCD3-LCD3-LCD3-LCD3-LCD3					
1-4. CCD4- 1-4. CCD4- 1-4. CCD4- 1-5. COM2 1-6. COM3- 1-7. CCD4- 1-7. CCD4- 1-8. CCD7- 1-8. CCD7- 1-9. CC		diode switch(see Diode Sw. Matrix Operation			
1-4 CCD4- 1-4 CCD4- 1-5 COMPS 1-7 CCD3- 1-7 CCD4- 1-7 CCD5- 1-7 CCD4- 1-7 CCD5- 1-7 CCD4- 1-7 CC		vd hetseles and not 2-JOG to RMD off thether the			
1-4. LCD4- LCD3 will be a segment signal output terminal for the LCD (More 1) Louis It is a segment signal output terminal for the UCD (More 2) LCD3- LCD3 will be allowed between these terminals and LCD- Pull (More 3) LCD4- LCD4		NO tudino OM-T2 + H"			
1-4. LCDA- LCD3- L		: ((W)ON .wS			
1-4. CDCD3 - LCD3 - LCD		(2) When 5T-MO was selected:			
1-4. CCD23 - CCD23 - CCD Tought It is a segment signal output terminal for the LCD CMOS CMOS Segment of the CMO		"L" - DNR output, OFF			
1-4. CDCD3 - C		MO tuctue and +"H"	(2700		
1-4 CCD23 - LCD3 - LCD 2-5 Segment (Mote 1) 2-5 COM2 2-5 COM2 2-5 COM2 2-5 COM2 2-5 COM2 2-5 COM2 3-6 COM2 3-7 CCD4 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7 CCD5 3-7					
1-4. LCD2- LCD2- LCD3- L					
1-4 CCD3- COMD. Common in the library of the librar					/ 1
1-4 C.D.23 - C.D.24 - D. 25 - C.D.25 -	30003		DNIB	DNIBB	21
1-4 C.D.3 - C.D.2. C.D.3 - C.D		Connect a 4.5MHz crystal to it. Adjust the oscillation		ox	91
1.2 CONST. COMPART STATES A CONSTRUCT OF CON	Indnl	This is a connection terminal for a crystal oscillator.	lst'X		
1.2 LCD23 LC		freely to OPEN, GND or VDD.			
1.2 CD73 CD73 CD73 CD73 CD73 CD73 CD73 CD73	_		1000	201	4.1
2.5.4. LCD2.3 COMP. 2.6. COMP. 2.7. COMP. 2.6. COMP. 2.7. COMP. 2.6. COMP. 2.7. COMP. 2.7. COMP. 2.8. COMP. 2.8. COMP. 2.8. COMP. 2.9. COMP. 2.9. COMP. 2.0 COMP. 2.0 COMP. 2.1 COMP. 2.1 COMP. 2.2 COMP. 2.3 VID. 3.3 VDD. 3.3 VDD. 3.4 COMP. 3.5 COMP. 3.6 COMP. 3.7 COMP. 3.8 COMP. 3.9 COMP. 4. COMP. 4. COMP. 5. COMP. 6. COMP. 6			UN	JN	νι
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1.2 LCD23 LCD23 LCD23 LCD23 LCD3 LCD3 LCD23 LCD3 LCD3 LCD3 LCD3 LCD3 LCD3 LCD3 LCD	199.7	used. This terminal, during low level; causes the PLL			
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2.5.4. LCD23. LCD23. LCD24. LCD24. LCD24. LCD25. LCD23. LCD23. LCD23. LCD23. LCD23. LCD24. LCD24. LCD24. LCD27. LCD24. LCD27. LC		no IO3 gnizu enotetore and therefore using EO1 or			
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2.2. LCD2.3 LCD2.3 LCD2.3 LCD2 LCD2.3 LCD3.3		When the internal data memory(MAR) is retained	noitell		
14-5.2 LCD23- LC	ındııı	ZHIVIOCI -OT of the structure generated to to (VIM q-qVč.O)		(81.1	0
2.5.2 LCD23 Segment Trix together with COM1 or COM3 CM2 Segment Trix together with COM1 or COM3 CM2 CM2 CM2 CM2 CM2 CM2 CM3			EVV 1 OC.	EVV	8
2.6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2		power supply will operate with only the voltage suppl-			
2.5.2 LCD23- LCD2 Segment Taylor of the LCD CMOS CMOS CMOS CMOS CMOS CMOS CMOS CMOS		As pin 7 and pin 33 are connected inside the chip, this			
2.6.2.2. LCD23- LCD23- LCD2 Segment Tailor and This is a segment signal output terminal for the LCD COD3- LCD23- LCD23- LCD2-					
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14-5.2 LCD23- LCD LCD5 LCD6 Segment first logarither with COM1 or COM2. LCD7 LCD7 LCD7 LCD7 LCD7 COM7 CO			Power	NDD	55.7
74-5.2 LCD2.3 LCD This is a segment signal output terminal for the LCD Pulput (Note 1) COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD, More LCD COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, GND, 1/2 VDD and VDD, CMOS COM2 LCD It allows 3 types of values, Le, COM3 LCD And VDD, CMOS COM2 LCD It allows 3 types of values, Le, COM3 LCD And VDD, CMOS COM2 LCD It allows 3 types VDD, CMOS COM2 LCD It allows 3 types VDD, CMOS COM2 LCD It allows 3 types VDD, CMOS COM3 LCD It allows 3 types VDD, CMOS COM5 LCD It allows 3 types					
24-52 LCD23 - LCD 2 Segment Display up to 46 dots is possible by using a map Push 1-4 LCD1 LCD1	Ilun		indino		
44-52 LCD23- LCD LCD5 Segment Trix together with COM1 or COM2. LCD7 LCD7 LCD7 LCD7 LCD1 Lix is a segment signal output terminal for the LCD Pulput Trix together with COM1 or COM2. T-4 LCD4- LCD7				COM1	9
74-52 LCD23 - LCD Segment Trix together with COM1 or COM2. 1-4 LCD4- LCD7- LC					
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34-52 LCD23- LCD This is a segment signal output terminal for the LCD CMOS				CCDS	
" Jague					34-52
					Pin No.
lsnimaT lodmyZ old ai			Terminal	12dmy2	ald nig

COMPUTER **■**µPD 1708AG-886 MICRO

has been developed for use to the FM/MW radio in the U.S. and Australia. $\mbox{ver(1/2duty, 1/2 bias), in a chip is a CMOS microprocessor for digital tuning and}$ 1. Description
This IC, which contains a prescaler that operates up to 150MHz, PLL and LCD dri-

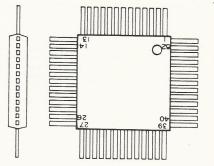
II. Features

(2) Low current-consuming CMOS. (1) 5v±10% single power supply.

(3) 3 bands with FM1/FM2/MW.
(4) UP/DOWN channel selectable by AUTO/MANUAL

(5) Preset and memory available for FM1/FM2/MW.

III. Outward Form



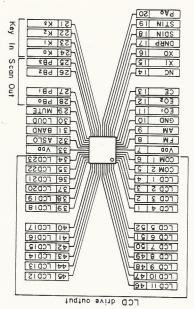
$\ensuremath{\text{N}}.$ Absolute Maximum Ratings(Ta=25 $\pm2\,\ensuremath{\text{C}}$)

Am	Ol	Ol	Output sink current
٨	$-0.3 \sim + \sqrt{00} + 0.3$	οΛ	Output voltage
٨	-0.3 - +0.3 -	ıV.	Input voltage
٨	0.3+~6.0-	ααΛ	Supply voltage
inU	BniteA	lodmy2	ltem

V. Receive Bands

10.7kHz	ZPKHZ	1 OOKH ^z	zHM6.701~6.78	FM	
d 20KHz	2HYS	2HY6	231~1,629kHz	WM	Australia
10.7kHz	ZEKHZ	200kHz	zHM6.701~6.78	ЬМ	A.S.U
₫20KH ^z	1 OKHZ	1 OKH ^z	230~1,710kHz	WM	V 511
Frequency	Frequency	Space	Range		
ətsibəmətni	Somparative	Channel	Freduency	GNA8	ьэтА

VI. Terminal Connection



Pin No.	Symbol	Terminal Name	Function	1/0
32		LO/DX (MTL)	(R) This is a LOcal/DX signal output port. "H" · Local "L" · DX (T) This is an MTL controlled output port. (See Momentary Sw. No. ⁷⁰) "H" · Controlled output. ON "L" · Controlled output. OFF	CMOS Push- Pull

^{*} In the abover Table.() in the terminal name indicates the name in tape mode. (R) indicates the

function in radio mode. (T) indicates the function in tape mode.

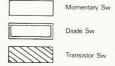
(Note 1) When the power is applied(VDD=Low *High)and when the CKSTP instruction is executed a low level(display OFF mode)will be output automatically

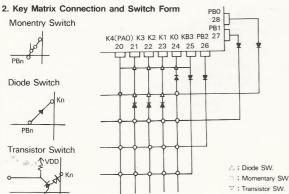
(Note 2) Because it incorporates an AC amplifier, it is necessary to input by cutting with a capaci-

VII. Key Matrix

1. Key Matrix Connection Table

	PAO 20Pin	K3 21Pin	K2 22Pin	K1 23Pin	KO 24Pin
PAO 20Pin	2	T · MODE	C 2	B 3	A 4
PBO 28Pin		R/T	CLKSEL .	USA 7	VAND 8
PA1 27Pin	9 PS/AS	(M-UP) . UP	11 (M-DOWN) DOWN	12 RCAL	(SEEK) TUNE
PA2 26Pin	14 M1	15 M2 (dbx)	16 M3 (DOL-C)	17 M4 (DOL-B)	18 M5 (APC)
PB3 25Pin	20 MTL	(ST-MO) APC	(DNR) DOL-B	23 LOUD	M6 (MTL)





3. Diode Sw

The initial setting diode matrix will be read when the power is applied at the beginning (V_{DD}: LOW→High)and when the EC terminal changes from the low to the high level.

In the Table below, "O" means the diode switch is OFF (Open) and "1" does the diode switch is ON(Short).

No.	Switch name	Function
0	T-MODE	This is a switch to be used when the function of "TUNE" key 13is set. 1: "TUNE" key will become a SEEK up key and UP/DOWN keys 10, 11, irrespective of the selected channel mode, will become Manual, and UP/DOWN key. 0: "TUNE" key can become a channel selection mode key and, by auto switches(A B, C)and in T1 or T2 mode, the UP/DOWN key can become a Man, Auto, Scan UP/DOWN key(See Function of TUNE13on Momentary Sw)
0000	C B A	This is a switch to be used when a function mode is set. It provides a function mode to be executed by the combination of ON/OFF of diode switches A, B and C. (See Diode Sw. Matrix Operation Table)
6	CLKSEL	Use this switch when setting for the display or no display of the clock. 1: Clock is to be displayed. 0: Clock is not to be displayed.
0	USA	Use this switch when setting the destination. 1: Australia 0: U.S.A.

Diode Sw. Matrix Operation Table

	lode SV	N		Function								
C 2	В3	A 4	TUNE	Dual	DOL B	DOL C	dbx	AMBW	DNR	APC	MTL	LOUD
0	0	0	T1			-	-	-				
0	0	1	T1			-	-		-			
0	1	0	T1				-		-			
0	1	1	T1						-			
1	0	0	T2						-			
1	0	1	T1	_		-	-	-	-			
1	1	0	T1	_	s-	-	-	-				
1	1	1	T1			-	-		-			

1 : ON (short)

See function of TUNE or on Momentary Sw

4. Transistor Sw.

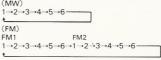
No.	Switch name	Function
(3)	R/T	Use this switch when seeing if it is the tape mode or radio mode. 1: Radio mode C: Tape mode If it is tape mode, the switches and outputs on the radio will become OFF condition while if it is radio mode, the switches and outputs on the tape will become OFF condition.

5. Momentary Sw.

No.	Switch name	Function
8	BAND	Use this switch when switching the band. Each time the key is pushed, switching will be make as FM1. FM2, MW and so on, and will receive the last channel memory of a newly switched band. Also, "Low" at time of AM or "High" at time of FM will be output from the controlled signal output terminal for switching FM and MW. If this key is pushed during display of the clock, the key will be accepted to cause display of the frequency. According to the priority or if the priority is clock display, a clock display will be made in about 5 seconds
9	PS/AS	Use PS/AS when making a preset scan or an auto store. Either of the two can be selected by the way it is pushed as follows. Continue to push the key more than 2 seconds for "Auto memroy" push and touch off the key less than 2 seconds for "Preset SCAN"

(1) Preset scan(PS)

For the Preset Scan(PS), the channels which have been preset will be called in sequence, i.e., for the MW. channels will be called from 1 to6 and, for the FM1 will be called from 1 to 6, then channels of FM2 will be called from 1 to 6, these will be repeated as follows (MW)



The called channel requires a different handling depending on whether the input of the SD signals on the channel is "High" or "Low"

a) When SD input(pin 18) is "High" When the SD input "High", the channel will be held. During the holding, the channel will be flashed(1Hz, duty 50%) Then, after reception which continues 5 seconds, proceed to the next pre

b) When SD input(pin 18) is "Low" When the SD input is "Low", the muting is not cancelled and therefore there will be no voice output. After waiting about 500ms, proceed to the

If the key is input during the PS the following handing will be required depending on the key which was input.

Key Name	Handling
BAND, RCAL M1, M6, UP DOWN	Cancel the PS and handle the key
DNR	Retain the PS and handle the invalid key
LOUD	When no selection has been made handle the invalid key
TUNE MTL	No acceptation allowed
PS/AS	Cancel the PS and retain the frequency of that time

If, during PS, the radio is switched to tape and the CE is changed from H to L, the PS Wil be cancelled. The reception frequency after a return is made to a radio condition by changing the setting from tape to radio and changing the CE from L to H, will become one channel having the SD which was received at the last.

And if it is impossible to receive the channel having the SD even once, the frequency which caused the PS to start will result.

(2) Auto store(AS)

The Auto Store(AS) will make an auto tuning in up direction from 87.9MHz, and will continue to store the channels whose SD(pin 18) have inputs of "High", from M1 to M6 in sequence. After this memorizing up to M6 is completed. M1 will be called to cancel the AS function.

In the first sweep, the auto tuning in the AS will continue to store M1 to M6 in sequence in Local mode(ASLO output (pin 32) "High"), However, when the memorizing up to M6 is not be made, Make auto tuning in DX mode (ASLO output "Low") until storing is made up to M6 thereafter, then retain the AS function.

The AS function.

The AS will continue to store the memory by making an auto tuning but the same frequency will not be stored in a different preset channel. If the Key is input during the AS, the following handling will be required depending on the Key which was input.

Key Name	Handling
BAND, RCAL M1, M6, UP DOWN	Cancel the AS then handle the key
ST-MO DNR	Retain the AS then handle the key
LOUD	If no selection has been made handle the invalid key
MTL, TUNE	No acceptation allowed
PS/AS	Cancel the AS if enen a key has been memorized, call
	1ch if no key has been memorized, return the AS to the started frequency to complete handing

Note that the reception frequency, after the RCAL (1) and band 8 are Note that the reception frequency, after the MCAL () and band 8 are pushed each, then are handled and returned to their onginal condition (RCAL with display of frequency and BAND by which the AS was done). will become that of when the AS was started. If, during AS, radio is switched to tape and CE is changed from H to L. the As will be changed from L to H thereafter, will the same as of

when the AS was started

on the T-MODE switch \bigoplus handling manner will become different Also, clo adjustments can be made by pushing this UP/DOWN key and "RCAL" key at the same time.	DOWN
The UP/DOWN key is used when a channel is selected. However, depending	٩U
Function	əmen
goitaguid	Switch

0

(0)

ON.

Вu

Make UP/DOWN on the selected channel selection mode by "TUNE" key (1) T-MODE←0 0

a) Manual Tuning Push UP/DOWN key to operate 1ch. UP or DOWN, If it is continued to be Push UP/DOWN key to operate 1 food will be made at Allms, intervals and

made to the lower limit. If the DOWN key is pushed and the lower limit is exceeded, a transfer will be made to the upper limit. by 1ch until the pushing is stopped. If the UP key is pushed and the upper limit is exceeded a transfer will be pushed more than 0.5 second, a feed will be made at 40ms intervals and

off and the frequency display for about 5 seconds. If while the UP/DOWN Key is continued to be pushed, the power is turned OFF, the tape mode is The UP/DOWN key, as it allows acceptation at time of clock display, will make a frequency display to permit the key to be handled. When the clock display is priority, the clock display will be made after the key is fou During manual tuning, there will be a mute output.

The UP/DOWN key works in the order it is pushed.

Therefore, if, after then, the power is turned ON, the tape mode is changed to OFF(radio, ON) and the CE is changed from L to H, a return to the frequency by which the UP/DOWM was started will result. memory will be made. changed to ON. or the CE is changed from H to L, no rewriting of the

If the UP/DOWM is pushed, an auto tuning will be made by going UP or DOWM by 1 ch. If, during the auto tuning, the SD signal "High" is input to (A SEEK) Auto Tuning (SEEK)

sm04 si s edge, starting will be made after a delay time of about 500ms. The sweep be retained for about 500ms.

Also when the frequency by which the auto tuning is started is of the band and the part of the p When the frequency at the band edge changes from the upper to the lower limit, a frequency after the change will be the change will be seen that the lower to the upper limit, a frequency after the change will be seen to the upper limit or the upper to the upper limit or the upper to the lower to the limit or the upper limit or the lower to the limit or the lower to t pin 18, a frequency of that time will be retained.

The SD signals, after PLL locking and a delay time of about 40ms, will be tested. If a "High" is input at that time, the auto tuning will be cancelled.

If, during the auto tuning, the power is turned OFF, the tape mode is changed WODE=1 (Note) The above also applies to the auto tuning by the IUNE key when I-

by which the former auto tuning was started will result. to ON or the CE is changed from H to L for signals other than those of the SD, there will be no rewriting of the last channel memory and the last

When, during auto tuning, the key is input, the following handling will be required depending on the key input.

AADED 3 KEY OTHER THAN THE BOOVE WAS INPUT, THE BUTO TURING MUST DE When a key other than the above was input, the auto funing must be required depending on the key input.

cancelled and the key handled.

auto	
for UP to UP and DOWN to DOWN cancel and stop the	
For UP to DOWN and DOWN to UP the tuning direction	JP DOWN
No acceptation allowed	UNE MTL
key(by diode Sw)	
When no selection has been made yet push the invalid	ANG
Retain the auto tuning then handle the key	W8 MA GUO.
	3C∀L
Cancel the auto tuning then handle the invalid key	9M , I M
	· SA\S9 QNA
Handing	кеу Иате

released from the UP, auto tuning of DOWN will be caused. key is pushed while the UP key is being pushed for instance, there will be no change because there is a link also to the auto tuning. If the finger is If the UP and DOWN key is continued to be pushed, a different handling will be required and the momentary key will be accepted by any key However, when the UP-DOWN key is continued to be upshed or the DOWN Ley is easily and the Bown and the property of t

When the UP/DOWN key is pushed the key being handled) during sweep or a stop for 5 seconds, the SCAN operation will be cancelled to cause a tion condition After 5 seconds, an auto tuning will be started again, After then SCAN operations will be repeated. The SCAN allows an auto funing to be made, and it, during sweep, the "High" input is made to the SD signal input to pin 18 a broadcast station, the channel will be held at the frequency for 5 seconds to cause a receptor (NADS) Burinut ctuA (C

display of the channel selection mode. For Man. UP/DOWN, no "Man' When T-MODE switch \hat{D} is "1", Man UP and DOWN will result irrespective of the "TUNE" key \hat{Q} Please see Manual Tuning in section (1), a) The difference between Man, UP/DOWN when T-MODE is "0" is the (S) T-MODE+ 1

(3) Clock adjustments If UP/DOWN key is pushed together will RCAL key it 12 it will be possible display will be made.

Continue to push RCAL key @ and push UP key @ to adjust the digit of minute by changing minute. Push one time to allow the clock to gain one minute by changing accord, a fast feed as a speed of 8 minutes per second will be possible minute and the push of the setunim gnitzulbA (6

until the finger is released from the key. In the adjustment of minute, the minute digit will not be carried up to time

digit. The second with each time it is adjusted will be reset and becomes 0

sunou BuitsulbA (d

of 4 hous per hour will be possible until the tinger is released from the key If the key is continued to be pushed over 0.5 second a fast feed at a sp direction. digit. Each it is pushed, it allows gaining one hour changing only in the UP to push RCAL key is and push DOWN key (1) to adjust the hour

The hour adjustment will not affect the minute and second at all.

8203R

a frequency display for the called preset memory will be provided. spuoses 7 time when this key is accepted, the display of the frequency being receive This key can be accepted even if it is pushed during the clock display. At oe made. pushed key is the same as the present preset channel, no mute output will memorized in the pushed key will be for reception.

While a judging is being made whether it is a calling or writing, there will be a mute output. However, when it is now receiving the preset and the If the preset key is pushed and then touched off in 2 seconds, the channel 9) Calling 60 9W Keep pushing the key for more than 2 seconds to writes. (DAY Let the finger go from the key in 2 seconds to call. SM (8) pushed as follows. 8-20T) The selection of writing and calling will be decided by the way the key is 0 ħΜ This is a key for writing and calling a preset memory.

To one key, the MW, FMI and FMZ correspond separately so that it is possible to memorize different frequencies from a total, of 18 channels prossible to memorize different frequencies from a total, of 18 channels. (FOC-C) W3 (9) (xqp) Radio mode ZW (1) key in the tape mode. This key can be used as a preset key in the radio mode and also as a function IN 1 For others including the timing, See item (2) "Auto Tuning(SEEK)" in section, UP and DOWN (0 AND 0) Cancel the auto tuning Invalid key MTL usuqiud rue iuvsjiq key Retain the auto tuning, then handle the invalid key ANG OM-TS Cancel the auto tuning, then handle the key UP DOWN BuilbreH Nar Acceptation of the keys during the auto tuning are as follows. will be made. The "SEEK" indicator will light during the auto tuning but no other displays If the key is pushed, upping will be made by one step for auto funing, and an SD Signal "HIGH" is input during the auto funing, the auto funing will be cancelled and the frequency of that time relained. and the UP/DOWN key will become Man, UP/DOWN while the TUNE key will become a SEEK UP key. When T-MODE switch 1 is "1", the channel selection mode will be gone (S) T-MODE+ 1 The key cannot be accepted during auto tuning or PS/AS. NYOS. ... SEEK... Man→SEEK→SCAN (T2 mode) Man "SEEK. -nsM As the "Man" in T1 mode and the "SCAN" in T2 mode have been used as the segment. Man, will not be displayed in T2 mode.

T1 mode.

T1 mode. The channel selection mode will be LCD displayed(in " in figures shown mode. As shown above, the channel selection mode will change each time it is pushed. And, the UP/DOWN key for each Mgn→SEEK→SCAN (T21 mode) Man←SEEK (abom []) Diode switch @ allows T1 or T2 mode to be selected. 0→3dOM-T(f) mode selection key or a SEEK UP key. TUNE 0 When, during clock display, the display priority is changed to the frequency or when, during the frequency display, the display priority is changed to the clock, the display will change respectively about 5 seconds after the change if TUME key $_{13}$ is pushed after about 750ms, no display priority will change if TUME key $_{13}$ is pushed after about 750ms, no display priority will change In about 750ms after RCAL key has been pushed, the display priority will (3) Changing the display priority (2) Adjusting the clock See item (3) in UP. DOWN keys 0 and 0. the display priority is the frequency, the display of frequency will made 5 seconds after a shift to the clock. When the clock display will change to the clock about 5 seconds after a shift to the frequency. Push and let the finger go from this key to allow a change of display. When (1) Changing the display by diode switch (6) This RCAL key can be accepted when the clock display present has been selected the control of th RCAL (1) released from UP/DOWN key. finger is released from UP key 10 s time adjustment fast feet will result. If the finger is not released from RCAL key 12 rt will be possible to adjust the times even if the UP/DOWM key is turned ON/OFF any times. However, if the finger is released from RCAL key 12 during handling, the handling will be stopped and handling of other keys cannot be made until the finger is released from UP/DOWM key. The first pushed the first served. Even if DOWN key 11 is pushed while adjusting the minute with UP key 10 by keeping pushing RCAL key 12 the time cannot be adjusted. If DOWN key 11 will have been pushed when the

3) Relations between minute and hour adjustments

Function 1

augu

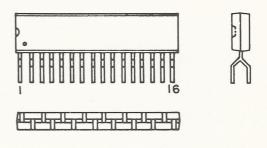
Switch

.oN

No.	Switch mane	Function							
	mano	b) Writing If the preset key is pushed and the pushing is continued more than 7							
		seconds,the frequency being received at present will be written in the memory corresponding to the pushed key. After a 2-second time to dicide whether it is a calling or writing passes the mute will be cancelled, indicating the writing has been completed							
		Same as calling, when a preset is being received at present and if the channel which is being received now is going to be written in the present preset channel, there will be no mute output. It is possible to write even during the clock display. At time when the key is pushed, a display of the frequency being received now will be provided and after deciding time of 2 seconds, this frequency will be written							
		c) During deciding Even if other keys are pushed during deciding on whether it is calling or writing, there will be no effect. During the deciding, the decision will be made only on whether the pushed key has been touched off or not and therefore no their keys will be checked. Also, even if the CE is changed from H to L and the radio is changed to the tape during deciding, there will be no rewriting. If, after then, a return to the radio condition is made after changing the CE setting from L to H and changing the setting from tape to radio, a freque- ncy at time of when the preset was pushed will be provided.							
		(2) Tape mode In the tape mode, each Dual which was set by the initial seting diode will become a function key(See Diode Sw, Matrix Operation Table) 1½ M1 → (OFF) 15 M2 → d0x 16 M3 → DOL-C 17 M4 → DOL-B 18 M5 → APC 19 M1 → MTL These keys are not always executed in the tape mode but combinations of the initial setting diodes A, B and C ('4', 3', 2',)will decide whether the keys are executed or not							
		a) APC, MTL Each time the key is pushed, the controlled output corresponding to the key will reverse, making a display corresponding to the key at the same time.							
		b) DOL-B, DOL-C, dbx Each time the key is pushed, ON/OFF will be repeated. Combinations of two ports will cause controlled outputs to be made. Also, a display corre sponding to the output will be made. However, there will be no display of dbx.							
		DOL-B DOL-C and dbx do not mean that the two turn ON at the same time. They mean that, if dbx is turned ON while DOL-B is ON, DOL-B turns OFF and dbx turns ON.							
		DOL DOL C dbx Display SDIN DNRP (18pin) (17pin)							
		ON BLANK H H							
20	MTL	If the Dual has not been selected by the diode switch, and invalid key will be cancelled in the tape mode. This key will work as an execution mode if the Dual has not been selected by the diode switch in the tape mode(See Diode Sw. Matrix). Each time the key is pushed, ON/OFF will be repeated. At time of ON, "High"							
21)	(ST/MO) APC	will be output from output port(pin 32) together with the display. This key serves in two ways according to the Diode Sw Matrix.							
	Alc	(1) APC If, in the tape mode, the Dual selection by the Diode switch has not been made but the DOL-B has been selected by the Diode switch, an APC exe cution mode will be caused. Each time this key is pushed, ON/OFF will be repeated, allowing the port output and display from pin 31 to be made.							
	(2) ST-MO If, in the radio mode, the ST-MO has been selected by the Diode sw and the MW is being received, an ST-MO execution mode will be cau Each this key is pushed. ON/OFF will be repeated, allowing the port ou and display from Pin 17 to be made. Since APC and ST-MO nave a different execution mode, both resp.								
	(DNR) DOL-B	independently even if both APC and ST-MO have been selected. This key serves in two ways according to the Diode Sw Matrix.							
		(1) DOL-B If, in the tape mode, the Dual has pot been selected by the Diods switch and the DOL-B has been selected, a DOL-B execution mode will be caused Each time this key is pushed. ON/OFF will repeated, allowing the port out put and display from Pin 18 to be made.							
		(2) DNR If, the DNR has been selected by the Diode switch, a DNR execution mode will be caused. Each time this key is pushed, ON/OFF will be repeated, allowing the port output and display from Pin 17 to be made. Also, this key can be accepted							
		in both the radio and tape modes. (Note) DOL-B and DNR have a common execution mode so that it does not happen that the two are selected at the same time.							
23	LOUD	This key is used when the Loudness function is controlled. Each time this key is pushed, ON/OFF will be repeated. When it is ON, "Low" will be output from the output port(pin 30), with the display made at the same time.							

■ LA3370 PLL FM MULTIPLEX STE-REO DEMODULATOR

Outward Form



Maximum ratings(Ta=25°C)

Item	Symbol	Rating	Unit
Supply Voltage	V _{cc} max	16	V
Power Dissipation	P₀max	520, (Ta≦45°C)	mW

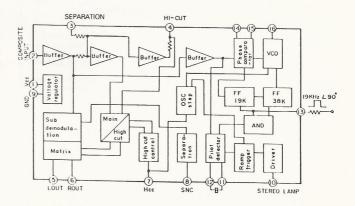
Electrical Characteristics

(Ta=25°C , V_{cc} =10V, V_i =300mV, f=1KHz

L+R=90%, pilot=10%)

Item	Symbol	Condition	Min	Тур	Max	Unit
Channel Separation	Sep		40	50		dB
Monaural Distortion	monoTHD	mono=300mV		0.05	0.2	%
Stereo Distortion	ST THD	MAIN		0.05	0.2	%
Output Signal Level	V _O	sub	140	200	280	mV
S/N	S/N		70	78		dB
Vco Stopping Voltage	V _{co STOP}			6.8		٧
Channel Balance	СН Ва			0.5	1.5	dB

Block Diagram





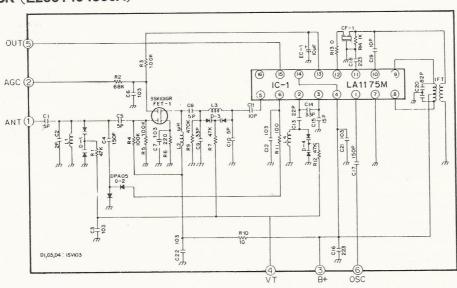
NOTE: Substitute applies figure in bracket under Part No. column SMS SME(Miniature-sized standard)
SRA(Super Miniature standard)
SRE(Further Miniature more than SRA SERIES)

REF. NO		IUMBER	DESCRIPTION	OT'Y	QT'Y REF. NO	PART NUMBER			
	HEI	CLARION		Qi i	MEF. NO	HEI	CLARION	DESCRIPTION	ΩΤ
TU02	E2001404400A	-	TUNER-AM, CET-510 AH	1	C103, 111, 202				
TU01	E2001404500A	-	TUNER-FM, CET-515F	1	C501, 506	CE04BT1H100M	179-1063-62	ELEC. 50V, 10UF	
U601	UPD1708AG886		IC-PLL, FIP, 52P, CUSTIOM	1	C314, 313	CE04DTIV4R7M	182-4753-52	ELEC, 35V, 4.7UF	1
U301	UKIA8125S	-	IC-EQ/AMP, SIP, KIA8125S	1	C112	CE04BT1H2R2M	179-2253-62	ELEC. 50V, 2.2UF	
U101	UKIA8129Z	051-1154-00	IC-FM/IF, ZIP, KIA8129Z	1	C301, 304	CE04BT1H4R7M	179-4753-62	ELEC. 50V, 4.7UF	
U102	ULA3370	051-0308-00	IC-MPX, ZIP, LA3370	1	C407, 413	CE04DT1H0R1M	182-1043-62	ELEC. 50V, 0.1UF	2
U501	KIA7299P	-	IC-POWER KIA7299P	1	C120	CE04VT1C100M	183-1063-32	ELEC. 16V, 10UF	1.
X601	E2007500200A	-	X-TAL 4.5MHZ, 16PF	1	C117	CE04VT1C4R7M	183-4753-32	ELEC. 16V, 4.7UF	
L201	E2003106900A	-	IFT-AM/TRAP 5.6 MICRO	1	C108, 606	CE04VT1C470M	183-4763-32	ELEC. 16V, 47UF	1
T101	E2003205000A	-	IFT-DET, 10.7MHZ, PL-7	1	C127, 604	CE04VT1E3R3M	183-3353-42	ELEC. 25V, 3.3UF	2
L701	E2003207300A	-	COIL-CHOKE, 0.8MH, 1A	- 1	C119, 126	CE04VT1H010M	183-1053-62	ELEC. 50V, 1UF	2
CF01	E2003301801A		FILTER-CER, SFE10.7MHZ	1	C612	CE04VT1H2R2M	183-2253-62	ELEC. 50V, 2.2UF	1
DP01	E2007600200A	060-0122-00	SURGE PROTECTOR DIODE	1	C610, 611	CC45CT1H200J	174-2000-13	CER. 50V, 20PF	2
Q605, 606	TTDTA114TS	-	TRANSISTOR, DTA114TS	2	C113	CC45RT1H100J	174-1000-37	CER. 50V, 10PF	1
Q701	TTDTA114YS		TRANSISTOR, DTA114YS	1	C121	CGP1XT1C682M		CER. 16V, 6800PF	1
Q702	TTDTA123JS	- ,	TRANSISTOR, DTA123JS	1	C114, 115	CG45XN1E103M	171-1033-06	CER. 25V, 0.01UF	2
Q604	TTDTA144ES	125-0004-03	TRANSISTOR, DTA144ES	1	C104, 105, 106	CG45XN1E473M	171-4733-06	CER. 25V, 0.047UF	3
Q602	TTDTC114TS	-	TRANSISTOR, DTC114TS	1	C118	CKP1BT1H681K	_	CER. 50V, 680PF	1
Q703	TTDTC124XS	-	TRANSISTOR, DTC124XS	1	C101, 102, 109			SEIN 864, 88611	+ '
Q603	TTDTC143ES	125-2007-01	TRANSISTOR, DTC143ES	-1	C123, 201, 204	CKP1FT1E223Z	_	CER. 25V, 0.022UF	10
0704	TTKTC2236AO	-	TRANSISTOR, KTC2236A-O	1	C605, 609, 613				
0601, 607, 608	TT2SC3337A	102-3327-01	TRANSISTOR, 2SC3327-A	3	C614			2.00	Sign "
FEO1	TT2SK369V	108-0369-00	TRANSISTOR, 2SK369-V	1	C116	CK45BT1H151K	160-1512-05	CER. 50V, 150PF	-
D705	DN1N4004B	001-0153-00	DIODE, 1N4004B	1	C414, 509, 510	CQ92BN1H154K	173-1542-10		1
D 7 01	DTBZX83C10B	001-0376-50	DIODE ZENER, 10V 500MW	1	C511, 705	- Total Million	175 1542-10	MYLAR. 50V, 0.15UF	5
D624	DTBZX83C5V1B	001-0376-29	DIODE ZENER, 5.1V 500MW	2	C130, 131, 502	CQ92BT1H102K	173-1022-10	MYLAR. 50V, 1000PF	-
D610	DTBZX83C5V6B	001-0376-32	DIODE ZENER, 5.6V 500MW	1	C505	- San Time Car	173-1022-10	WITLAN. 50V, 1000PF	4
D609	DTBZX83C6V2B	001-0376-35	DIODE ZENER, 6.2V 500MW	1	C129, 128	CQ92BT1H223K	173-2232-10	MV/ AD FOV GOODIE	-
0605	DTBZX83C6V8B	001-0376-38	DIODE ZENER, 6.8V 500MW	1	C415, 416	CQ92BTIH273K	173-2232-10	MYLAR. 50V, 0.022UF	2
0602	DTBZX83C8V2B	001-0376-44	DIODE ZENER, 8.2V 1/2W	1	C307, 311	CQ92BT1H333K		MYLAR. 50V, 0.027UF	2
0607, 706	DTBZX83C9V1C	001-0376-48	DIODE ZENER, 9.1V 1/2W	2	C302, 303	CQ92BT1H152J	173-3332-10	MYLAR. 50V, 0.033UF	2
0704	DT1N4001A	-	DIODE IN4001A	1	R122, 123, 206		111 1001 01	MYLAR. 50V, 1500PF	1
0101, 102, 103					R701	RD2CP0T0100J	111-1001-91	R-CARBON, 1/6W, 10 OHM	3
0104, 105, 201					R103	RD2CP0T0101J	111-1011-91	R-CARBON, 1/6W, 100 0HM	1
202, 203, 301					R117, 409, 612			(-
0302, 601, 603					R409, 613, 627	RD2CP0T0102J	111-1021-91	R-CARBON, 1/6W, 1K OHM	8
0606, 608, 613	DT1SS133	001-0294-00	DIODE, 1SS133	25	R628, 634			The state of the s	
0615, 616, 617				25	R105, 112, 125				
0618, 619, 620					R202, 211, 601	RD2CPOTO103J	111-1031-91	R-CARBON, 1/6W, 10K 0HM	6
0621, 622, 623					R207, 303, 311	RD2CPOT0104J	111-1041-91	R-CARBON, 1/6W, 100K OHM	3
0627					R116	RD2CPOTO123J		R-CARBON, 1/6W, 12K OHM	
608, 617	CE04BN1A221M	042-0378-00	ELEC, 10V, 220UF	2	R111	RD2CPOT0152J		R-CARBON, 1/6W, 1.5K OHM	1
513, 515	CE04BN1A222M	-	ELEC. 10V, 2200UF	2	R109	RD2CPOT0153J		R-CARBON, 1/6W, 15K OHM	1
508	CE02BN1C222M	042-0348-00		2	R110, 120, 121	RD2CPOTO183J		-	1
122, 203, 306	SECESITION	042-0348-00	ELEC. 16V, 2200UF	1	R505, 506	RD2CPOTO220J		R-CARBON, 1/6W, 18K OHM	3
312, 503, 504	CE04BT1A101M	170 1072 22	FI FO 401/ 4001/F		R115, 304, 310	RD2CPOTO222J		R-CARBON, 1/6W, 22 OHM	2
507, 512, 514	SECTE I A I O I W	179-1073-22	ELEC. 10V, 100UF	11	R205, 606, 607		111-2221-91	R-CARBON, 1/6W, 2.2K OHM	3
601, 701					R620, 621, 632	RD2CPOTO223J	111 2221 01	D CARRON A (OL)	
305	CEO4PT1 A 2 2 4 4	170 0075	FI 50 404		R633, 631	NDZCFU1UZZ3J	111-2231-91	R-CARBON, 1/6W, 22K OHM	8
	CE04BT1A221M	179-2273-22	ELEC. 10V, 220UF	1		500017000100			
702	CE04BT1C470M	179-4763-32	ELEC. 16V, 47UF		RV01, RV04	E20017G00103		R-TRIMMER 10K OHM	2
615	CE04BT1E330M	179-3363-42	ELEC. 25V, 33UF	1	RV02	E20017G00203	-	R-TRIMMER 20K OHM	1

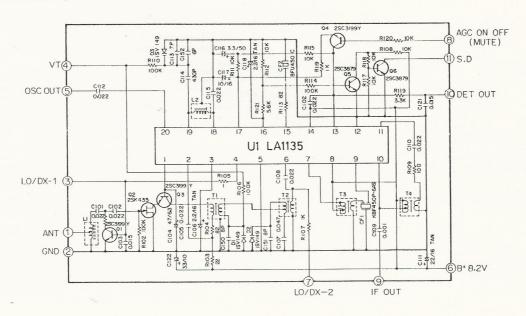
	PART NU	JMBER	DESCRIPTION	QT'Y
REF. NO	HEI	CLARION	DESCRIPTION	
R208	RD2CPOTO273J	111-2731-91	R-CARBON, 1/6W, 27K OHM	1
R104	RD2CPOTO331J	111-3311-91	R-CARBON, 1/6W, 330 OHM	1
R107, 118, 119 R630	RD2CPOTO332J	111-3321-91	R-CARBON, 1/6W, 3.3K OHM	4
R114, 203, 204 R622, 623, 624 R625' 626	RD2CPOTO333J	111-3331-91	R-CARBON, 1/6W, 33K OHM	8
R106, 302, 312	RD2CPOTO392J	111-3921-91	R-CARBON, 1/6W, 3.9K OHM	3
R610, 614, 704	RD2CPOTO471J	111-4711-91	R-CARBON, 1/6W, 470 OHM	3
R113	RD2CPOTO472J	111-4721-91	R-CARBON, 1/6W, 4.7K OHM	1
R618	RD2CPOTO473J	111-4731-91	R-CARBON, 1/6W, 47K OHM	1
R301, 313	RD2CPOTO560J	111-5601-91	R-CARBON, 1/6W, 56K OHM	2
R101, 108, 124 R201, 611	RD2CPOTO562J	111-5621-91	R-CARBON, 1/6W, 5.6K OHM	6

	PART NU	JMBER	DESCRIPTION	ΩΤ'Υ
REF. NO	HEI	CLARION	DESCRIPTION	Q1 1
R615	RD2EPOTO564J	111-5641-91	R-CARBON, 1/4W, 560K OHM	1
R603, 609, 314 R315	RD2CPOTO682J	111-6821-91	R-CARBON, 1/6W, 6.8K OHM	4
R705	RD2EPOTO221J	111-2211-91	R-CARBON, 1/4W, 220 OHM	1
R616	RD2EPTO2222J	111-2221-91	R-CARBON, 1/4W, 2.2K OHM	1
R617	RD2EPOTO332J	111-3321-91	R-CARBON, 1/4W, 3.3K OHM	1
R619, 629	RD2EPOTO391J	111-3921-91	R-CARBON, 1/4W, 390 OHM	2
R706	RD2EPOTO4R7J	111-4791-91	R-CARBON, 1/4W, 4.7 OHM	1
R209	RD2EPOTO472J	111-4721-91	R-CARBON, 1/4W, 4.7K OHM	1
R703	RD2HPOTO4R7J	111-4791-81	R-CARBON, 1/2W, 4.7 OHM	1

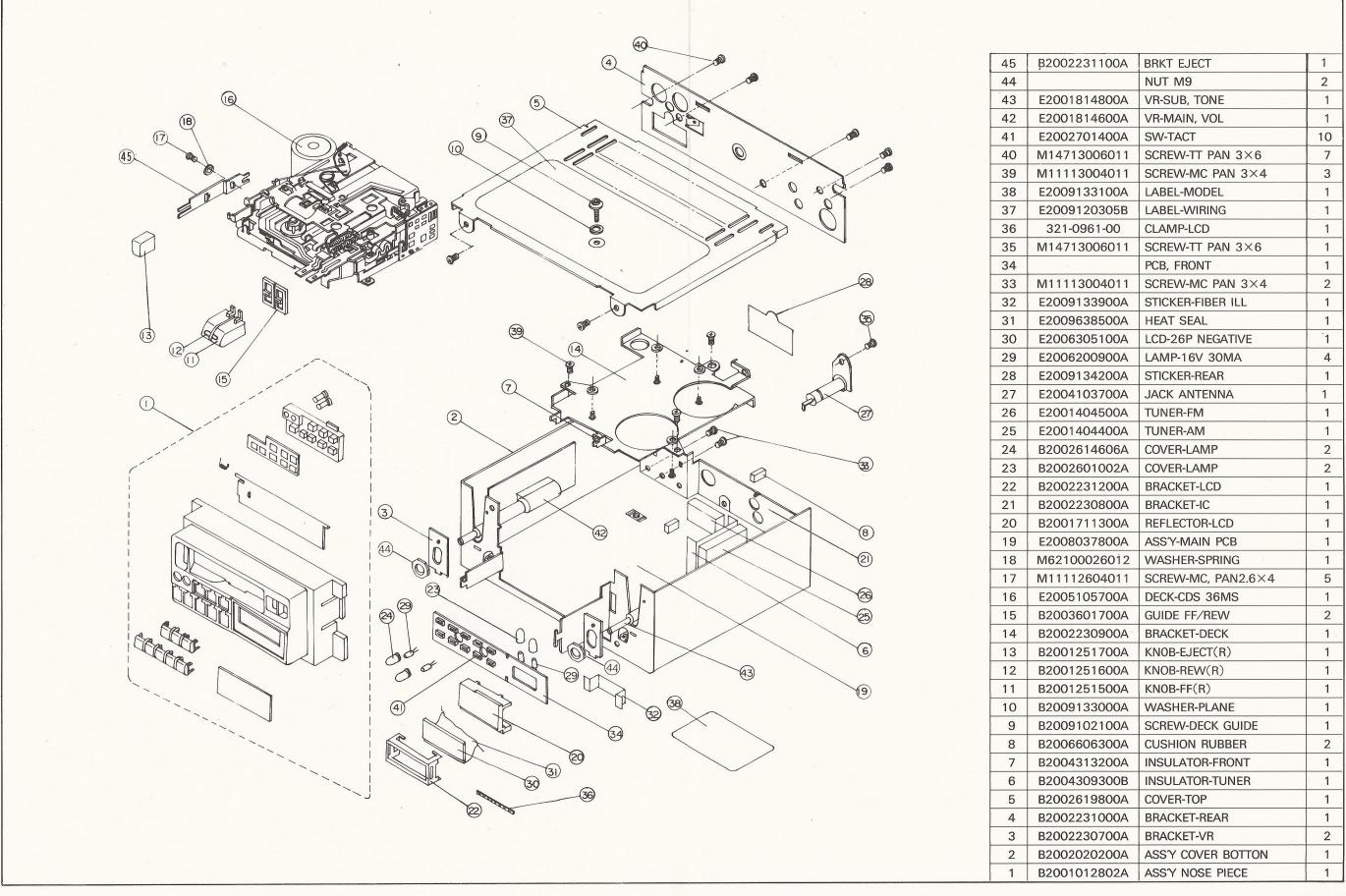
● FM TUNER PACK (E2001404500A)

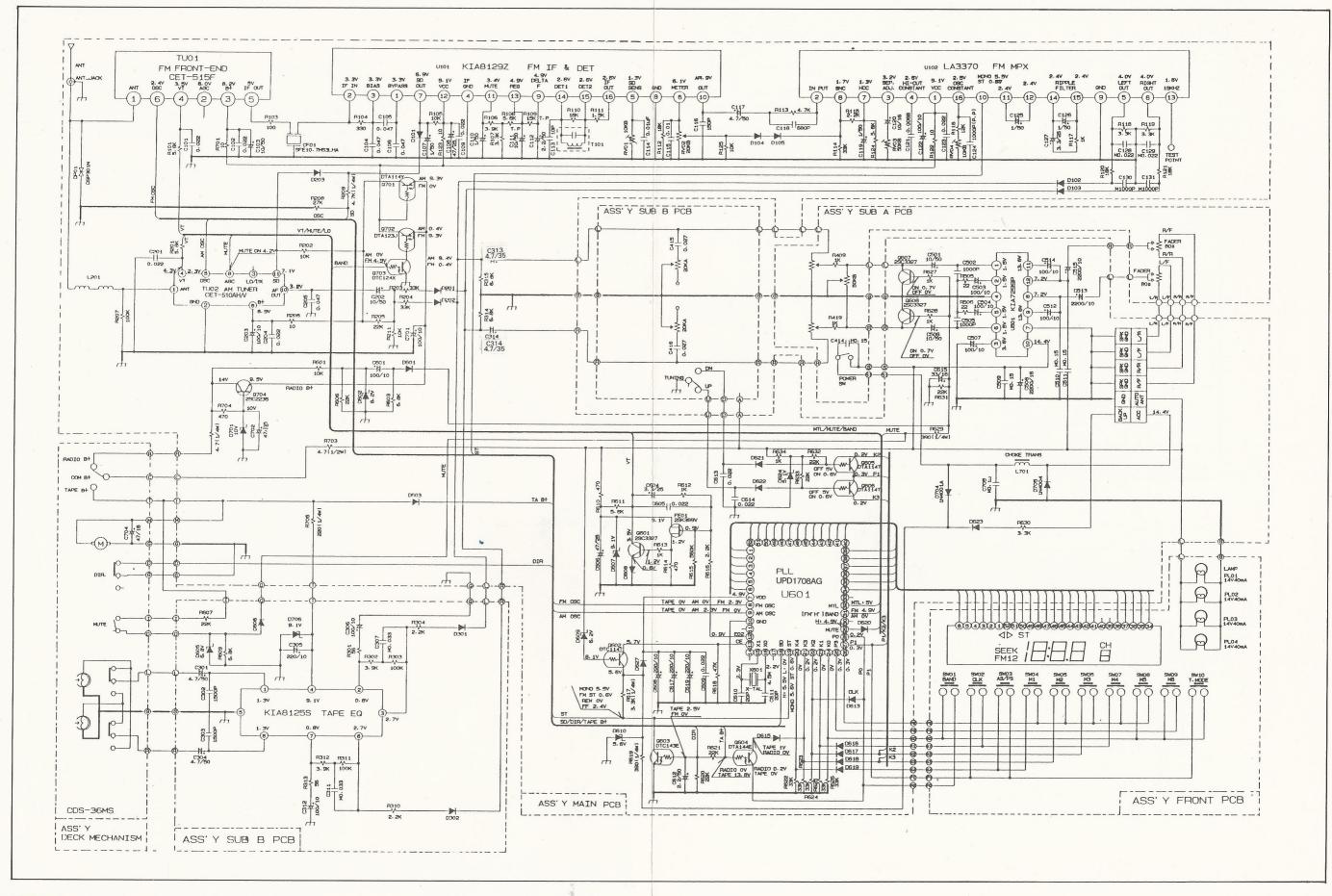


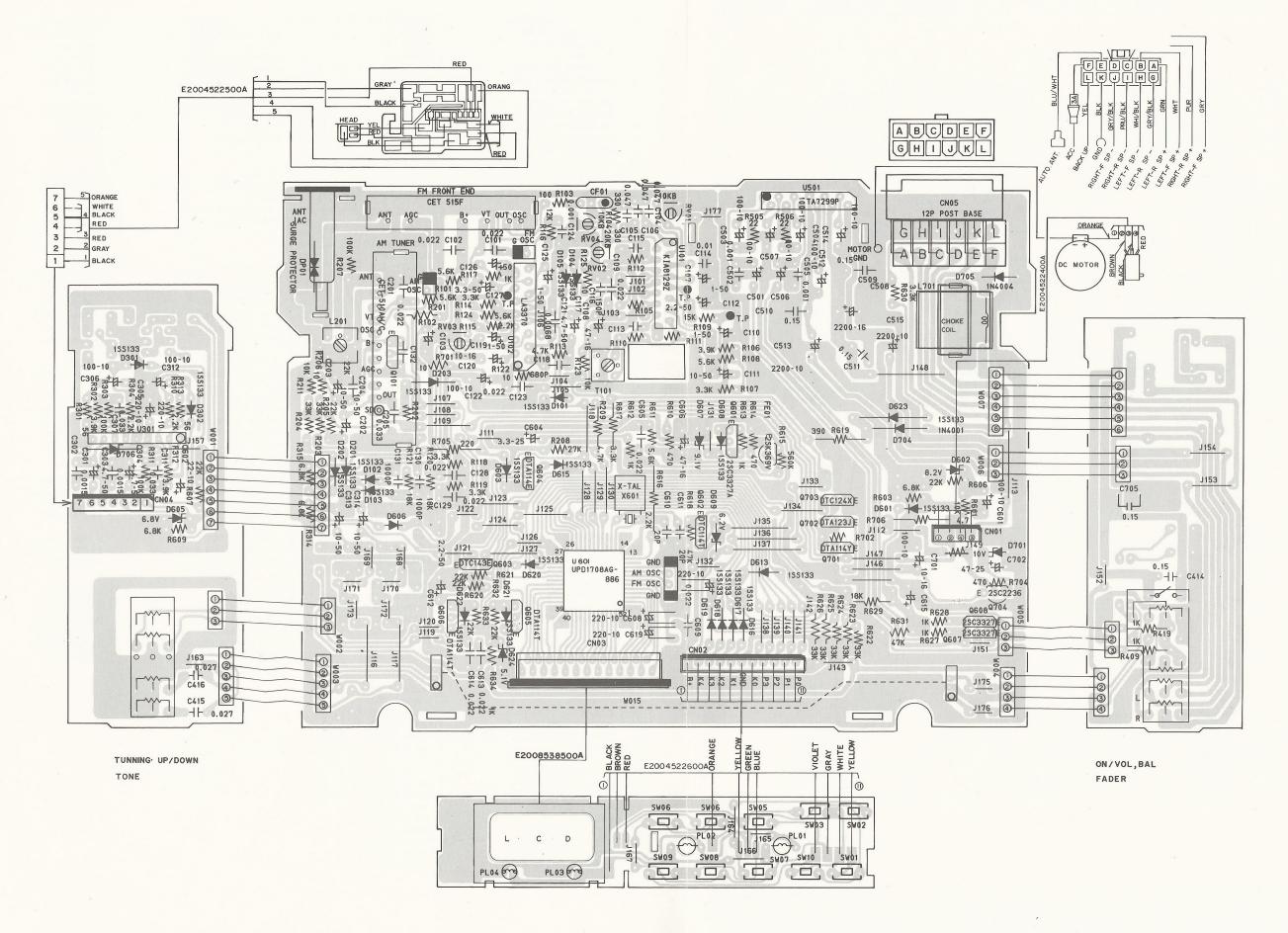
• AM TUNER PACK (E2001404400A)



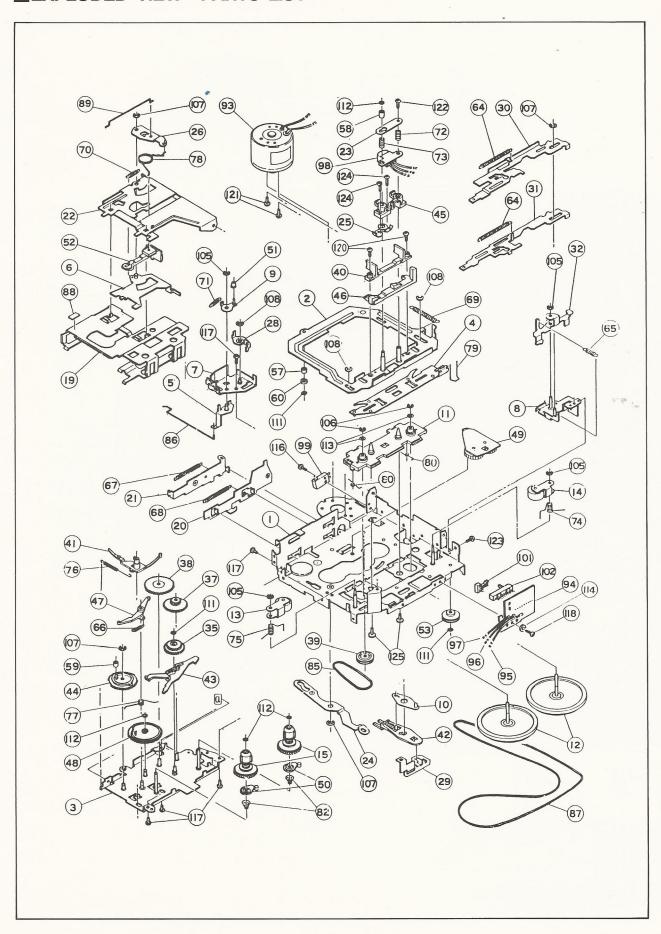








EXPLODED VIEW - PARTS LIST :



PARTS LIST:

GEAR LOCK ARM SPRING

EJECT CAM LOCK SPRING

ADJUSTER ARM SPRING (A)

PROGRAM ARM SPRING

EJECT LEVER SPRING

EJECT CAM SPRING

HEAK PLATE SPRING

66

67

68

69

70

71

72

10.	OESCRIRTION	REFERENCE NO.	Q'TY	NO.	OESCRIRTION	REFERENCE NO.	Q'
1	MAIN CHASSIS ASS'Y	3-0036-101	(1)	73	ADJUSTER ARM SPRING (B)	1-0036-411-02	1
2	HEAD PLATE ASS'Y	3-0036-102	(1)	74	PINCH ARM (F) SPRING	1-0036-412-01	1
3	REEL BASE ASS'Y	3-0036-109	(1)	75	PINCH ARM (R) SPRING	1-0036-413-01	1
1	FR CHANGE ARM ASS'Y	3-0036-110	(1)	76	RATCHET SPRING	1-0036-414-01	
5	CHANGE LEVER(A) ASS'Y	3-0036-114	(1)	77	SELECTOR GEAR SPRING	1-0036-415-02	
,	EJECT CAM LOCK ASS'Y	The same of the sa					
- 1		3-0036-119	(1)	78	CENTER PLATE SPRING	1-0036-416	
	BRACKET (R) ASS'Y	3-0036-120	(1)	79	SW CHANGE ARM SPRING	1-0036-417-01	
1	BRACKET (F) ASS'Y	3-0036-121	(1)	80	EARTH SPRING	1-0036-418-01	
	PROGRAM ARM ASS'Y	3-0036-124	(1)	81			
)	FR ARM(A) ASS'Y	3-0036-125	(1)	82	TENSION SPRING	1-0036-416-00	
	CM BRACKET ASS'Y	3-0036-216	(1)	83			
	FLYWHEEL ASS'Y	3-0036-601-01	2	84			
	PINCH ARM (R) ASS'Y	3-0036-611	(1)	85	SUB BELT	1-0036-501-00	
	PINCH ARM (R) ASS'Y	3-0036-612	(1)	86	SELECTOR LINK		
	REEL SPINDLE ASS'Y					1-0036-503-01	
- 1	REEL SPINDLE ASS 1	3-0036-660	(2)	87	MAIN BELT	1-0036-504-00	
				88	C.H.CUSHION RUBBER	1-0010-509-02	
				89	RETURN LINK	1-0058-504-02	
3				90			
	CASSETTE HOLDER	1-0036-103-01	1	91			1
)	EJECT CAM ASS'Y	3-0036-106	(1)	92			
	EJECT LEVER	1-0036-107-00	1	93	MOTOR ASS'Y	3-0058-710-10	
	CASSETTE HANGER	1-0036-108-00	1	94	SW PWB	1-0036-711-00	\
	SPRING PUSH PLATE	1-0036-115-00	1	95			1
					WIRE (A) BRACK	1-0036-702-01	
- 1	REVERSE LEVER	1-0036-116-01	1	96	WIRE (B) RED	1-0036-703-01	
	ADJUSTER CAM	1-0036-117-00	1	97	WIRE (C) YELLOW	1-0036-704-01	-
	CENTER PLATE	1-0036-118-00	1	98	HEAD (TC860BH)	1-0036-705-00	
				99	POWER SW	1-0036-711-01	
	CHANGE LEVER (B)	1-0036-123-03	1	100			
	FR ARM (B)	1-0036-126-00	1	101	MUTE SW	1-0058-702	
	E LEVER	1-0036-127-00	1	102	HEAD CHANGE SW (SL132B)	1-0036-707-02	
	REW LEVER	1-0036-128-00	1	103	TIEAD CHANGE SW (SE132B)	1-0030-707-02	
.	LOCK ARM	The second second second second	1000	C 5000 / SE A			
		1-0036-129-00	1	104			
3	SW ARM	1-0036-130-00	1	105	E-RING E-1.5	2-171D-040-06	
.				106	E-RING E-1.6×3.2×0.3	2-171E-032-96	1
5	IDLE GEAR	1-0036-201-00	1	107	E-RING E-2.0	2-1712-050-06	
;	TU GEAR	1-0036-202-01	2	108	E-RING E-2.5	2-171K-060-06	
'	REDUCTION GEAR (A)	1-0036-204-00	1	109		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-
3	REDUCTION GEAR (B)	1-0036-203-00	1	110			
	PULLEY GEAR	1-0036-205-00	1	111	POLY WASHER W/N 1.2×3×0.25	2-1812-030-D2	
,	TAPE GUIDE	1-0036-206-01					1
		20.000000000000000000000000000000000000	1	112	POLY WASHER W/N 1.6×3.2×0.25	2-1816-032-D2	
où.	RATCHET	1-0036-207-01	1	113	POLY WASHER 2.1×3.2×0.25	2-1821-032-D1	
	FF ARM	1-0036-208-00	1	114	M/WASHER	1-0012-517-00	
	SENSOR ARM	1-0036-209-00	1	115			
-	SELECTOR GEAR	1-0036-210-01	1	116	MACHINE+SCREW B-TITE	2-138F-060-H2	
	ADJUSTER ARM	1-0036-211-01	1	117	MACHINE+SCREW B-TITE	2-1382-030-H2	
	ADJUSTER LINK	1-0036-212-01	1	118	MACHINE+SCREW B-TITE	2-1382-040-H2	
	GEAR LOCK ARM	1-0036-213-00	1	119		2 1302-040-112	
,	DETECTOR GEAR						
- 1		1-0036-214-00	1	120	MACHINE LOCATION	0.4655.5	
	TU GEAR ARM	1-0036-215-01	1	121	MACHINE+SCREW	2-1032-025-H2	
)	DETECTOR ARM	1-0036-217-00	2	122	MACHINE+SCREW	2-1012-040-H2	
	PROGRAM ARM COLLAR	1-0036-218-00	1	123	MACHINE+SCREW	2-1012-030-S2	
۱	TAPE HOOKER	1-0058-204-02	1	124	MACHINE+SCREW	2-1022-050-H2	
	IDLE PULLEY (A)	1-0058-221-01	1	125	EJECT HOOK SEREW M2×5	1-0061-522-00	
				126	MACHINE+SCREW S-TITE	2-1332-040-H2	
				120	tormate i conteva o file	2 1002-040-nZ	
	UD BOLLED (B)						
	HP ROLLER (B)	1-0036-324-00	1				
3	FF ROLLER	1-0036-304-01	1				
1	COLLAR	1-0036-318-02	1				
)	HP ROLLER (A)	1-0036-302-00	1				
	SW ARM COLLAR	1-0036-329-00	1	1-51			
	TU GEAR SHAFT	1-0036-329-00	2				
- 1	TO GLAN SHALL	1-0036-330-00					
	FF (DFIA) FI (FD COOK)						
.	FF/REW LEVER SPRING	1-0036-401-01	2				
,	LOCK LEVER SPRING	1-0036-402-01	1				
a l	GEAR LOCK ARM SPRING	1.0026.402.02	1 2				

1-0036-403-02

1-0036-404-01

1-0036-405-02

1-0036-406-01

1-0036-407-02

1-0036-408-00

1-0036-410-01

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8203RA Service Manual Correction Table

Page	OLD .	NEW
1	FM SECTION Frequency range: 87.9MHz to 107.9MHz	FM SECTION Frequency range: 87.5MHz to 107.9MHz
	AM SECTION Frequency range: 530KHz to 1710KHz	AM SECTION Frequency range : 531KHz to 1629KHz
2	1710KHz Expanded AM Band	Delete
11	0605, 606 TTDTA114TS - TRANSISTOR, DTA114TS 2 0701 TTDTA114YS - TRANSISTOR, DTA114YS 1	0605, 606 TIDTA114TS - TRANSISTOR, DTA114TS 2 Q101 TIDTC124ES - TRANSISTOR, DTC124ES 1 Q701 TIDTA114YS - TRANSISTOR, DTA114YS 1
0	D704 DT1N4001A — DIODE IN4001A 1 D101, 102, 103 D104, 105, 201 D202, 203, 301 D302, 601, 603 D606, 608, 613 D71SS133 D615, 616, 617 D618, 619, 620 D621, 622, 623	D704 DT1N4001A — DIODE IN4001A 1 DI04 DNLTZMRJS — DIODE LTZMRJS] D101, 102, 103 D202, 203, 301 D302, 601, 603 D606, 603, 613 D615, 616, 617 D618, 619, 620 D621, 622, 623 D627, 201, 999
c	R105, 112, 125 R202, 211, 601 RD2CPOT0103J 111-1031-91 R-CARBON, 1/6W, 10K OHM 6 R116 RD2CPOT0123J 111-1231-91 R-CARBON, 1/6W, 12K OHM 1 R111 RD2CPOT0152J 111-1521-91 R-CARBON, 1/6W, 1.5K OHM 1	R105. 112, R202. 211, 601 RD2CPOT0103J 111-1031-91 R-CARBON, 1/6W, 10K OHM 5 R116 RD2CPOT0123J 111-1231-91 R-CARBON, 1/6W, 12K OHM 1 R142 RD2CPOT0124; 111-1241-91 R-CARBON, 1/6W, 1226 OHM 1 R111 RD2CPOT0152J 111-1521-91 R-CARBON, 1/6W, 1.5K OHM 1
10	RV02 E20017G00203 — R-TRIMMER 20K OHM 1 R106, 302, 312 RD2CP0T0392J 111-3921-91 R-CARBON, 1/6W, 3.9K OHM 3	RV02 : E20017G00333 - R-TRIMMER 35KOHM 1 R302. 312 RD2CP0T0392J 111-3921-91 R-CARBON 1/6W 3 9K OHM 2
	R101, 108, 124 RD2CPOTO562J 111-5621-91 R-CARBON, 1/6W, 5.6K OHM 6 R201, 611 R603, 609, 314 RD2CPOTO682J 111-6821-91 R-CARBON, 1/6W, 6.8K OHM 4 R315	R101, 108, 150 R201, 611, R003, 609, 314 R315, 106 RD2CPOTO582J 111-6821-91 R-CARBON, 1/6W, 5.6K OHM 5
13	1 B2001012802A ASSY NOSE PIECE 1	1 B2001012807A ASSY NOSE PIECE 1
	20 B2001711300A REFLECTOR-LCD 1 22 B2002231200A BRACKET-LCD 1	20 B2002235600A REFLECTOR-LCD 1 22 B2002235600A BRACKET-LCD 1
	32 E2009133900A STICKER-FIBER ILL	32 E2009133900A BRACKET-ILL 1 38 E2009133107A LABEL-MODEL 1