ICF-303/303L

SERVICE MANUAL

Ver 1.0 1999, 07



Canadian Model E Model Australian Model Chinese Model

AEP Model

Photo: ICF-303

SPECIFICATIONS

Frequency range:

Central and East European model

Band	ICF-303	
FM	65 - 108 MHz	
AM	530 - 1605 kHz	

Italian model

Band	ICF-303	
FM	87.5 - 108 MHz	
AM	526.5 - 1606.5 kHz	

Other countries model

Band	ICF-303	ICF303L
FM	87.5 - 108 MHz	87.5 - 108 MHz
AM	530 - 1605 kHz	_
LW	_	153 - 255 kHz

Speaker

Approx. 6.6 cm (2 5/8 inches) dia., 8 Ω

Output

(earphone) jack (minijack)

Power output

100 mW (at 10 % harmonic distortion)

Power requirements

3 V DC, two R6 (size AA) batteries

3 V DC, two LR6 (size AA) batteries

Dimensions

Approx. $156.9\times82.5\times41.1$ mm (w/h/d) (6 $1/4\times3$ $1/4\times1$ 5/8 inches) incl. projecting parts and controls

Mass

Approx. 309.5 g (10.9 oz) incl. batteries

Supplied accessories

Operating instructions (1)

Design and specifications are subject to change without notice

Features

- · Compact radio
- TUNE indicator for easy tuning

FM/AM RADIO
ICF-303
FM/LW RADIO
ICF-303L



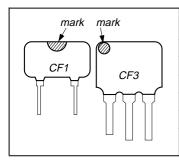


HOW TO CHANGE THE CERAMIC FILTERS

This model is used two ceramic filters of CF1 and CF3.

You must use same type of color marked ceramic filters in order to meet same specifications.

Therefore, the ceramic filter must change two pieces together since it's supply two pieces in one package as a spare parts.

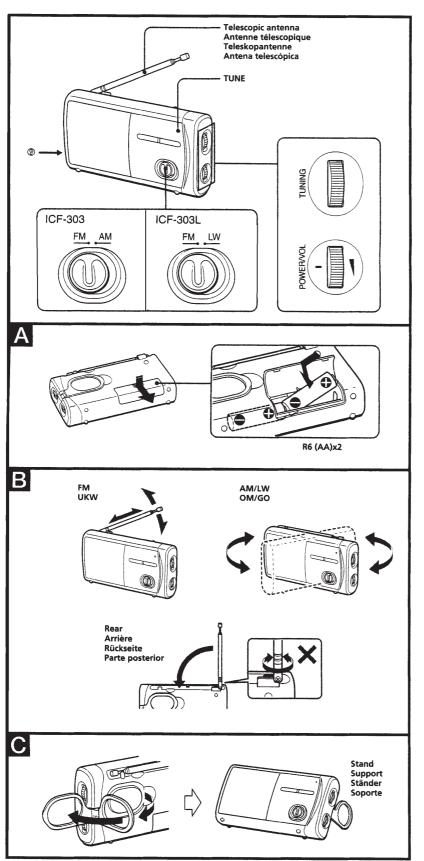


mark	Center Frequency
red	10.70 MHz
blue	10.67 MHz
orange	10.73 MHz
black	10.64 MHz
white	10.76 MHz

Notes on Chip Component Replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

This section is extracted from instruction manual.



Installing the Batteries (See fig. A)

- 1 Open the battery comparment lid.
- 2 Insert two R6 (size AA) batteries (not supplied) with correct polarity.
- **3** Close the lid.

Battery life

Using Sony batteries R6 (size AA): Approx. 35 hours

Using Sony alkaline batteries LR6 (size AA): Approx. 95 hours

Replacing batteries

When the sound becomes weak or distorted, replace all batteries with new ones.

Notes on batteries

- Do not charge the dry batteries.
 Do not carry the dry batteries with coins or other metallic objects. It can generate heat if the positive and negative terminals of the batteries are accidentally contacted by a metallic object.
- When you are not going to use the unit for a long time, remove the batteries to avoid damage from battery leakage and corrosion.

Operating the Radio

- 1 Turn up POWER/VOL to turn power on and adjust the volume.
- 2 Select a desired band.
- **3** Tune in to a station using TUNING. The TUNE indicator lights up when a station is tuned in.

To turn off the radio

Turn down POWER/VOL completely until a click is heard.

To listen with an earphone

Connect the earphone to the @ (earphone) jack. The speaker is deactivated when an earphone is connected.

To improve reception (See fig. B)

FM: Extend the telescopic antenna and adjust the angle for optimum reception.

AM/LW: Rotate the unit horizontally for optimum reception. A ferrite bar antenna is built into the unit.

Note

Do not rotate the telescopic antenna.

To use the stand (See fig. (C)

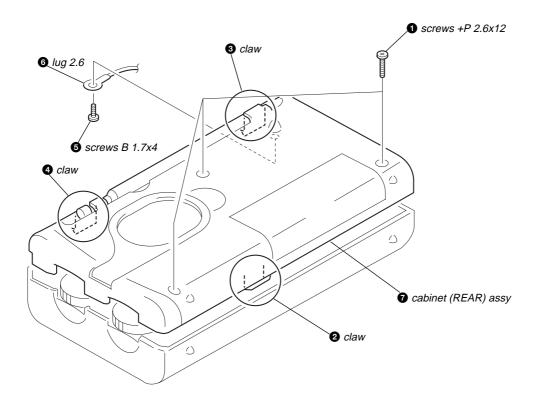
- To use the stand as support for the unit, unfold
- The stand half-way.

 The stand can also be used as a handle to carry the unit. For this purpose, unfold the stand completely.

SECTION 2 DISASSEMBLY

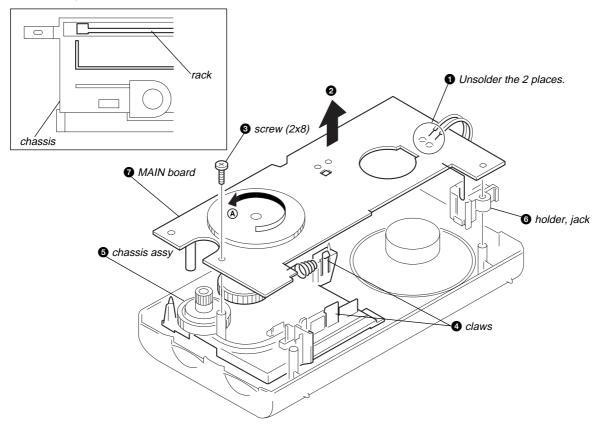
Note: Follow the disassembly procedure in the numerical order given.

2-1. CABINET (REAR) ASSY



2-2. MAIN BOARD

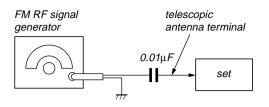
- Setting the Pointer
- 1. Turn the gear (tuning capacitor) in the direction of (A) until it is stopped.
- 2. Place the rack as shown in the figure.
- 3. Mount the pointer.



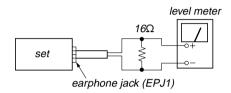
SECTION 3 ELECTRICAL ADJUSTMENTS

FM SECTION

BAND switch: FM



400Hz, 30% FM modulation frequency deviation ±22.5kHz Output level: as low as possible



• Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

ICF-303:

FM FREQUENCY COVERAGE ADJUSTMENT		
Adjust for a maximum reading on level meter		
L4	86.5 (87.35)	
	<64> MHz	
CT1-3	109.5 (108.25) MHz	

FM TRACKING ADJUSTMENT		
Adjust for a maximum reading on level meter		
1.2	86.5 (87.35)	
L2	<68> MHz	
CT1-2	109.5 (108.25)	
C11-2	<102> MHz	

NOTE : () : Italian model < > : East European model

ICF-303L:

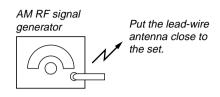
FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter	
L4	86.5 MHz
CT1-3	109.5 MHz

FM TRACKING ADJUSTMENT		
Adjust for a maximum reading on level meter		
L2 86.5 MHz		
CT1-2	109.5 MHz	

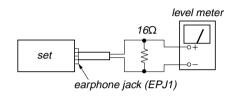
ICF-303:

AM SECTION

BAND switch: AM



400Hz, 30% AM modulation Output level: as low as possible



• Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

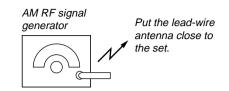
AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter	
L5	520 (516.5) kHz
CT1-4	1,650 (1,631.5) kHz

AM TRACKING ADJUSTMENT		
Adjust for a maximum reading on level meter		
L1	600 (620) kHz	
CT1-1	1,400 kHz	

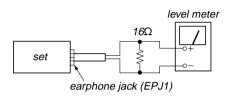
NOTE: no mark: (): Italian model

ICF-303L: LW SECTION

BAND switch: LW



400Hz, 30% AM modulation Output level: as low as possible

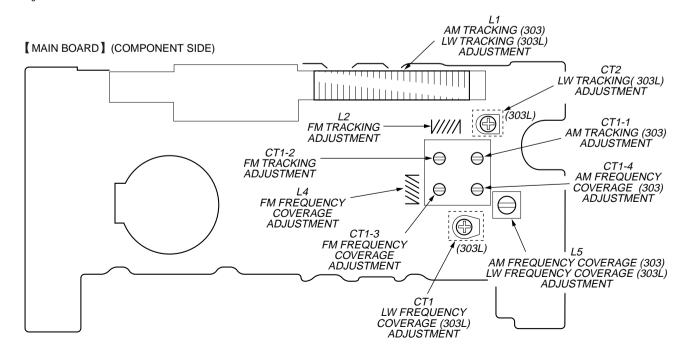


 Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

LW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter	
L5	145 kHz
CT1	265 kHz

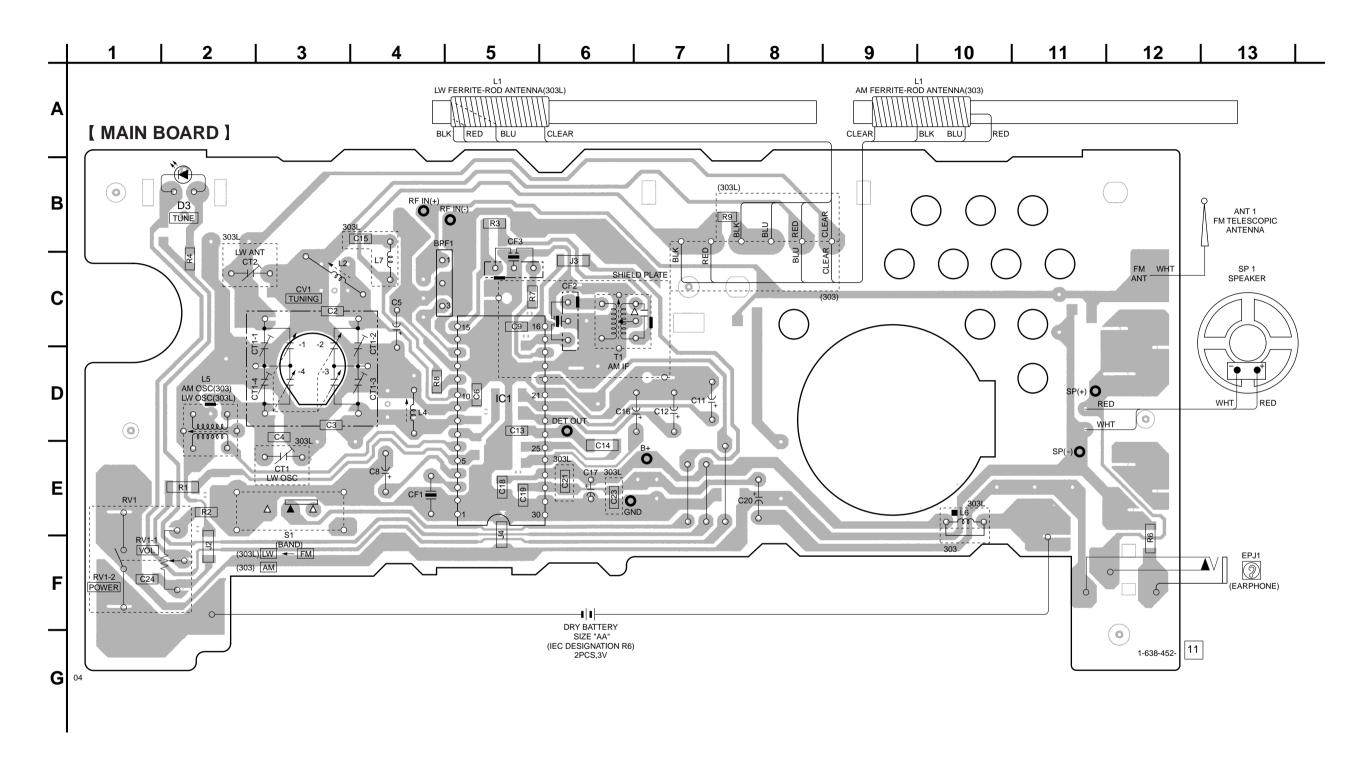
LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter	
L1	160 kHz
CT2	240 kHz

Adjustment Location: MAIN BOARD



SECTION 4 DIAGRAMS

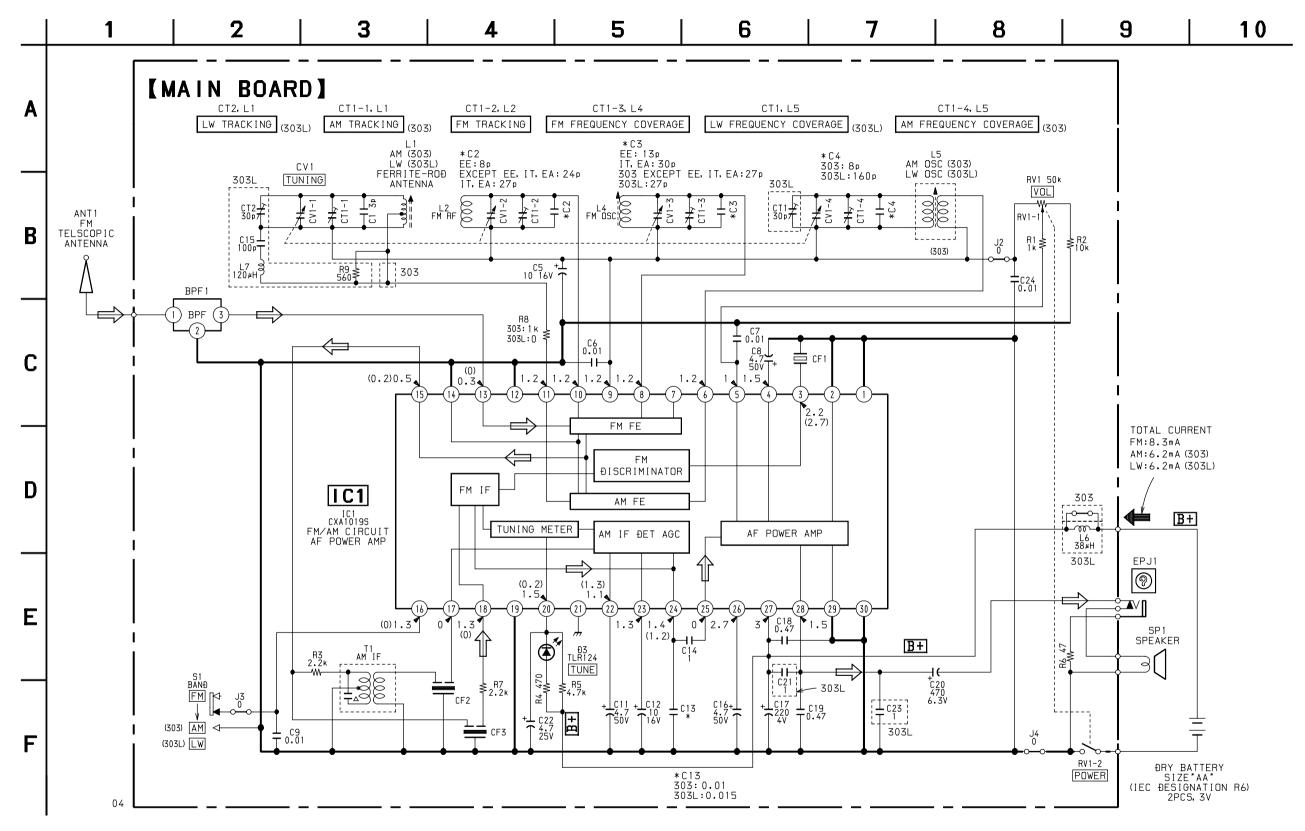
4-1. PRINTED WIRING BOARD



Note:

- : parts extracted from the component side.
- parts extracted from the conductor side.
- parts mounted on the conductor side.
- \(\(\triangle \) internal component.
- : Pattern from the side which enables seeing.

4-2. SCHEMATIC DIAGRAM



Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $^{\text{1}}/_{\text{4}}\,\text{W}$ or less unless otherwise specified.
- \(\Delta \) : internal component.
- _____ : panel designation.

- **B**+ : B+ Line.
- adjustment for repair.
- Total current is measured with power on.
- Power voltage is dc 3 V and fed with regulated dc power supply from battery terminal.
- Voltage is dc with respect to ground under no-signal (detuned) condition.
- no mark: FM
 (): AM or LW

- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.

Abbreviation

IT : Italian model EE : East European model

EA : Saudi Arabia model

SECTION 5 EXPLODED VIEW

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service.
 Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example :

KNOB, BALANCE (WHITE) ... (RED)

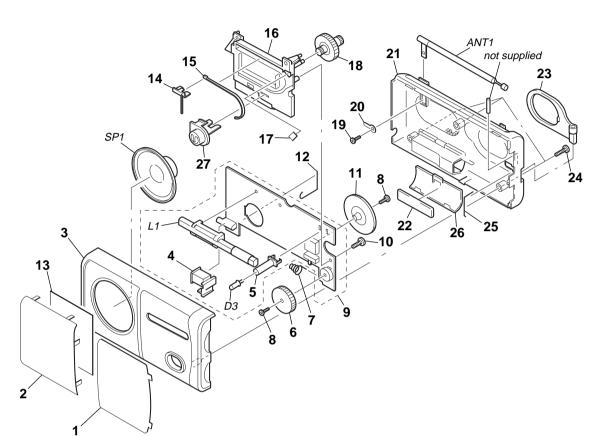
† †

Parts Color Cabinet's Color

• Accessories and packing materials are given in the last of this parts list.

- Abbreviation
- EE: East European model IT: Italian model

EA : Saudi Arabia model



Ref. No.	Part No.	<u>Description</u>	Remark	Ref. No.	Part No.	<u>Description</u>	Remark
1	3-037-044-01	PLATE, TRANSPARENT (303:EXCEPT	EE,IT,EA)	15	3-369-170-01	RACK	
1		PLATE, TRANSPARENT (IT,EA)		* 16	3-037-040-01	CHASSIS	
1	3-037-044-21	PLATE, TRANSPARENT (EE)		* 17	3-037-706-01	PLATE, RACK RETAINER	
1	3-037-044-31	PLATE, TRANSPARENT (303L)		18	3-037-041-01	KNOB (TUNE) (BLACK)	
2	3-037-046-01	PANEL (SPEAKER) (BLACK)		18	3-037-041-11	KNOB (TUNE) (WHITE) (EXCEPT EE)	
2	3-037-046-11	PANEL (SPEAKER) (WHITE) (EXCEPT	EE)	19	3-318-203-61	SCREW (B1.7X4), TAPPING	
3	3-037-038-01	CABINET (FRONT) (BLACK)		20	7-623-505-01	LUG, 2.6	
3	3-037-038-11	CABINET (FRONT) (WHITE) (EXCEPT	EE)	21	3-037-039-01	CABINET (REAR) (BLACK)	
4	3-037-045-01	HOLDER, JACK		21	3-037-039-11	CABINET (REAR) (WHITE) (EXCEPT EI	Ξ)
5	3-037-043-01	HOLDER, LED		22	3-372-124-01	CUSHION (BATTERY)	
6		KNOB (POWER/VOL) (BLACK)		23	3-037-024-01	HANDLE (BLACK)	
6	3-037-020-11	KNOB (POWER/VOL) (WHITE) (EXCE	PT EE)	23	3-037-024-11	HANDLE (WHITE) (EXCEPT EE)	
7	3-037-048-01	TERMINAL (–), BATTERY		24	7-685-136-19	SCREW +P 2.6X12 TYPE2 N-S	
8	3-880-990-00	SCREW (1.7X3), FLAT, (+) SPECIAL		25	3-037-034-01	SPRING (HANDLE)	
* 9	A-3663-369-A	MAIN BOARD, COMPLETE		26	3-037-019-01	LID, BATTERY CASE (BLACK)	
		(303:EXCEP	T EE,IT,EA)				
				26	3-037-019-11	LID, BATTERY CASE (WHITE) (EXCEP	ΓEE)
* 9	A-3663-372-A	MAIN BOARD, COMPLETE (303L)		27	3-037-042-01	KNOB (BAND) (BLACK)	
* 9	A-3663-375-A	MAIN BOARD, COMPLETE (EE)		27	3-037-042-11	KNOB (BAND) (WHITE) (EXCEPT EE)	
* 9	A-3663-378-A	MAIN BOARD, COMPLETE (IT,EA)		ANT1	1-501-247-21	ANTENNA, TELESCOPIC	
10	3-371-765-21	SCREW (2X8), +BTP		D3	8-719-069-94	LED TLR124 (TUNE)	
11	3-369-171-01	GEAR (TUNING CAPACITOR)					
				L1	1-402-566-11	ANTENNA, FERRITE-ROD (AM) (303)	
12	3-037-047-01	TERMINAL (+), BATTERY		L1	1-402-567-11	ANTENNA, FERRITE-ROD (LW) (303L)	
13 14	3-040-693-01 3-037-025-11	SHEET, SPEAKER (for WHITE) POINTER		SP1	1-529-456-11	SPEAKER (6.6cm)	

MAIN

SECTION 6 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
 RESISTORS
- RESISTORS
 All resistors are in ohms.
 METAL:Metal-film resistor.
 METAL OXIDE: Metal oxide-film resistor.
 F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

• SEMICONDUCTORS
In each case, u : μ, for example:
uA.. : μA.. uPA.. : μPA..
uPB.. : μPB.. uPC.. : μPC.. uPD.. : μPD..

• CAPACITORS

uF: μF
• COILS
uH: μH

When indicating parts by reference number, please include the board.

Abbreviation

EE : East European model
IT : Italian model
EA : Saudi Arabia model
CND : Cnadian model
AR : Argentina model
AUS : Australian model

CH: Chinese model

Ref. No.	Part No.	<u>Description</u>			<u>Remark</u>	Ref. No.	Part No.	<u>Description</u>			<u>Remark</u>
*	A-3663-369-A	MAIN BOARD, COMPLETE				C18	1-162-637-11	CERAMIC CHIP	0.47uF		16V
			(303:EXC	CEPT EE,IT,	,EA)	C19	1-162-637-11	CERAMIC CHIP	0.47uF		16V
*	A-3663-372-A	MAIN BOARD, COMPLETE (303L)			C20	1-126-941-11	ELECT	470uF	20%	6.3V	
*		MAIN BOARD, CO				C21	1-162-638-11	CERAMIC CHIP	1uF		16V
*		MAIN BOARD, CO									(303L)
		******		,		C23	1-162-638-11	CERAMIC CHIP	1uF		16V
						020	1 102 000 11	OLIVIIVIIO OIIII	141		(303L)
	3-037-043-01	HOLDER, LED									(3031)
	0 007 010 01	HOLDLIN, LLD				C24	1-163-031-11	CERAMIC CHIP	0.01uF		50V
		< BPF >				02.		02.0.000	0.0.0		
								< FILTER >			
BPF1	1-233-452-11	FILTER, BAND PA	SS (EE)								
BPF1		FILTER, BAND PA	. ,	PT FF)		CF1	1-567-097-61	FILTER, CERAMIC	2		
			(/		CF2		FILTER, CERAMIC			
		< CAPACITOR >				CF2		FILTER, CRYSTAL			
		. 0/11/1011/01()				CF3		FILTER, CERAMIC			
C2	1-163-091-00	CERAMIC CHIP	8PF		50V	0.0	1 007 077 01	TIETER, OLIVIN			
OZ.	1 103 071 00	OLIVIIVIIO OI III	011		(EE)			< TRIMMER >			
C2	1-163-102-00	CERAMIC CHIP	24PF	5%	50V			· Hammer			
02	1 100 102 00	OLIGINIO OTIII	2		T EE,IT,EA)	CT1	1-141-245-00	CAP, TRIMMER	30PF (303	31.)	
C2	1-163-103-00	CERAMIC CHIP	27PF	5%	50V	CT2		CAP, TRIMMER	30PF (303	- /	
02	1 100 100 00	OLIGINIO OTIII	2/11	070	(IT,EA)	012	1 111 210 00	O/II / TITIIVIIVIET	0011 (000	<i>3</i> L <i>j</i>	
C3	1-163-096-00	CERAMIC CHIP	13PF	5%	50V			< VARIABLE CAP	ACITOR >		
03	1 103 070 00	OLIVIIVIIO OI III	1311	370	(EE)			· WITTINDLE ON	1011010		
C3	1-163-104-00	CERAMIC CHIP	30PF	5%	50V	CT1	1-151-659-11	CAP, VARIABLE (EXCEDT EE)	
00	1 100 101 00	OLIGINIO OTIII	0011	070	(IT,EA)	CV1		CAP, VARIABLE (,	F)
					(11,211)	CT1		CAP, VARIABLE (.XOLI I L	-/
C3	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	CV1		CAP, VARIABLE (,	F)	
00	1 100 207 11	OLIGINIO OTIII	2/11	070	(303L)		1 101 007 22	OTH , WHEN IDEE (10111110) (2	/	
C3	1-163-713-11	CERAMIC CHIP	27PF	5%	50V			< DIODE >			
					T EE,IT,EA)						
C4	1-163-091-00	CERAMIC CHIP	8PF		50V	D3	8-719-069-94	LED TLR124 (TI	JNE)		
٠.	00 07. 00	02.4.4.4.0	0		(303)		0 7 1 7 00 7 7 1	225 .22(J.12)		
C4	1-163-122-00	CERAMIC CHIP	160PF	5%	50V			< JACK >			
					(303L)						
C5	1-126-157-11	ELECT	10uF	20%	16V	EPJ1	1-563-836-21	JACK (®)			
								(-)			
C6	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V			< IC >			
C8	1-126-163-11	ELECT	4.7uF	20%	50V						
C9	1-163-031-11	CERAMIC CHIP	0.01uF		50V	IC1	8-752-037-02	IC CXA1019S			
C11	1-126-163-11		4.7uF	20%	50V						
C12	1-126-157-11		10uF	20%	16V			< JUMPER RESIS	STOR >		
C13	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	J2	1-216-296-00	SHORT	0		
					(303)	J3	1-216-296-00		0		
C13	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V	J4	1-216-296-00	SHORT	0		
					(303L)						
C14	1-162-638-11	CERAMIC CHIP	1uF		16V			< COIL >			
C15		CERAMIC CHIP	100PF	5%	50V						
					(303L)	L1	1-402-566-11	ANTENNA, FERRI	TE-ROD (A	M) (303)	
C16	1-126-163-11	ELECT	4.7uF	20%	50V	L1		ANTENNA, FERRI	,	, , ,	
						L2	1-403-614-11	COIL, AIR-CORE	(EE)		
C17	1-124-434-00	ELECT	220uF	20%	4V	* L2		COIL, AIR-CORE	. ,	E)	
									•	-	

Ref. No. L4 L4 L4 L5 L6	Part No. 1-422-131-00 1-428-241-11 1-459-954-21 1-406-028-00 1-410-294-11	Description COIL, FM OSCILL COIL, AIR-CORE COIL (WITH COR COIL, OSC (MW) INDUCTOR	<u>Remark</u> T,EA)						
L7	1-412-316-11	INDUCTOR 120uH (303L)		03L)					
		< RESISTOR >							
R1 R2 R3 R4 R6	1-216-198-00 1-216-073-00 1-216-057-00 1-216-041-00 1-216-166-00	RES,CHIP METAL CHIP METAL CHIP METAL CHIP RES,CHIP	1K 10K 2.2K 470 47	5% 5% 5% 5% 5%	1/8W 1/10W 1/10W 1/10W 1/8W				
R7 R8	1-216-057-00 1-216-049-11	METAL CHIP RES,CHIP	2.2K 1K	5% 5%	1/10W 1/10W (303)				
R8 R9	1-216-295-00 1-216-043-00	SHORT RES,CHIP	0 560	5%	(303L) 1/10W (303L)				
	< VARIABLE RESISTOR >								
RV1	1-241-555-11	RES, VAR, CARBON 50K (POWER/VOL)							
		< SWITCH >							
S1	1-552-370-00	SWITCH, SLIDE (BAND)							
		< TRANSFORMER >							
T1 T1 *****	1-404-341-00 1-404-355-00 *******	·							
MISCELLANEOUS ********									
ANT1 1-501-247-21 ANTENNA, TELESCOPIC SP1 1-529-456-11 SPEAKER (6.6cm)									
ACCESSORIES & PACKING MATERIALS ************************************									
	3-867-126-11 MANUAL, INSTRUCTION (ENGLISH,FRENCH, GERMAN,SPANISH,DUTCH,ITALIAN,								
	3-867-126-21	PORTUGUESE) (CND,AEP,AR,IT) MANUAL, INSTRUCTION (ENGLISH,SWEDISH, DANISH,FINNISH,POLISH,CZECH, HUNGARIAN,RUSSIAN) (AEP,EE)							
	3-867-126-31	MANUAL, INSTRUCTION (ENGLISH,FRENCH, SPANISH,SIMPLIFIED CHINESE, ARABIC) (E,EA,AUS,CH)							

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