

# **FT-212RH**

## **TECHNICAL SUPPLEMENT**

**YAESU MUSEN CO., LTD.**  
**C.P.O. BOX 1500**  
**TOKYO, JAPAN**

MANUALE DI SERV. X  
FT-212 RH  
**05910738**



2 005910 738003

This manual is intended to serve as a supplement to the FT-212RH Operating Manual. Detailed information regarding functions, specifications, options and operation has been provided in the Operating Manual, and is not reprinted herein. Therefore, this supplement is not intended to serve as an independent reference, but to be used in conjunction with the information provided in the Operating Manual.

Because of the compactness and complexity of the double-sided glass-epoxy circuit boards used in the FT-212RH, four layout diagrams are provided for each board. Each side of the board is identified by the type of the majority of components installed on that side. In most cases one side has only chip components, and the other has either a mixture of both chip and lead components (trimmers, coils, electrolytic capacitors, packaged ICs, etc.), or lead components only. The two "obverse" views depict the board as it is seen when viewed directly with the eye, while the two "reverse" views depict the unseen side of the board as it would appear if one were to peer through the board from the other side without seeing the components and tracks on the near side.

While we believe the technical information in this manual is correct, Yaesu assumes no liability for damage that may occur as a result of typographical or other errors that may be present. Your cooperation in pointing out any inconsistencies in the technical information would be appreciated.

Yaesu Musen reserves the right to make changes in the circuitry of this transceiver, in the interest of technological improvement, without notification of the owners.

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# CIRCUIT BOARD ACCESS

## BOTTOM COVER REMOVAL

The following circuit boards are accessed by removing the bottom cover:

- Main Unit\* (component side)
- IF Unit\*
- Mic Unit\*
- APC Unit
- VCO Unit
- PA Unit (lower edge only)

To remove the bottom cover, remove the four screws marked "★" in Figure 1, plus the four marked "※" if the top cover has not already been removed. Then lift the cover away.

\* To access these boards it may be necessary to remove the loudspeaker and holder:

- (1) Referring to Figure 2, unplug the speaker wire connector from J1005 on the Main Unit, and lift the loudspeaker out of its bracket.
- (2) Remove the three screws in the arms of the speaker bracket and remove the bracket.

## TOP COVER REMOVAL

Removing the top cover exposes the Solder Side of the Main Unit circuit board and the top edge of the PA Unit board.

To remove the top cover, remove the four screws marked "◎" in Figure 1, plus the four marked "※" if the bottom cover has not already been removed. Then lift the cover away.

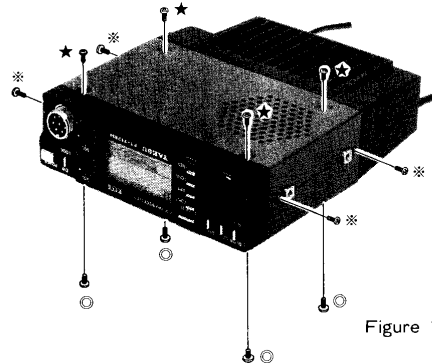


Figure 1

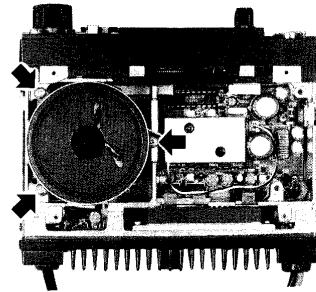


Figure 2

## FRONT PANEL REMOVAL

Removing the front panel allows access to the Control Unit and LCD Unit circuit boards.

- (1) After the top and bottom covers have been removed, pull off the Selector, VOL and SQL knobs.
- (2) Remove the nut from the microphone jack using a slotted ring wrench as shown in Figure 3.

The front panel can now be slid forward.

# CIRCUIT BOARD ACCESS

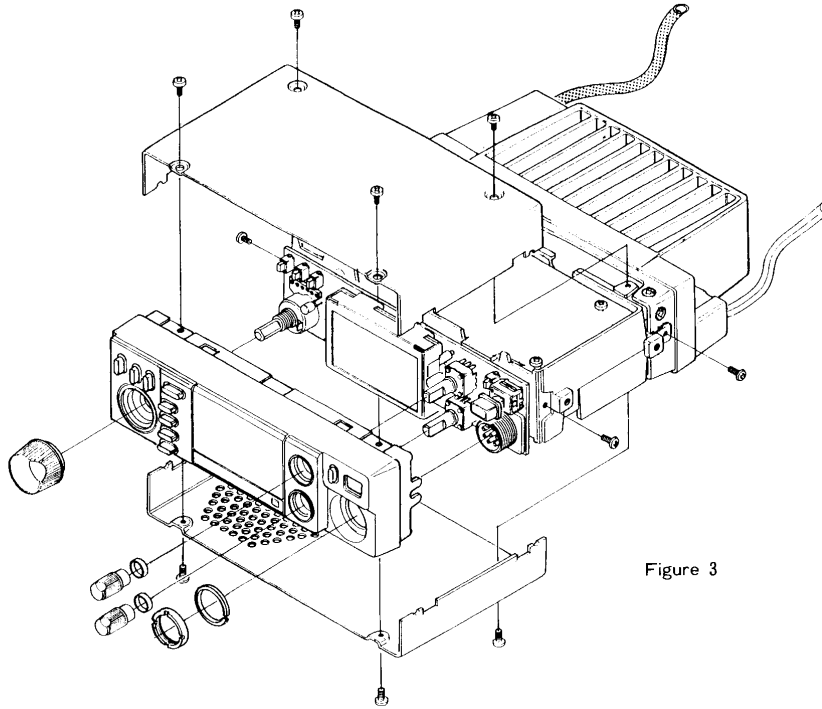
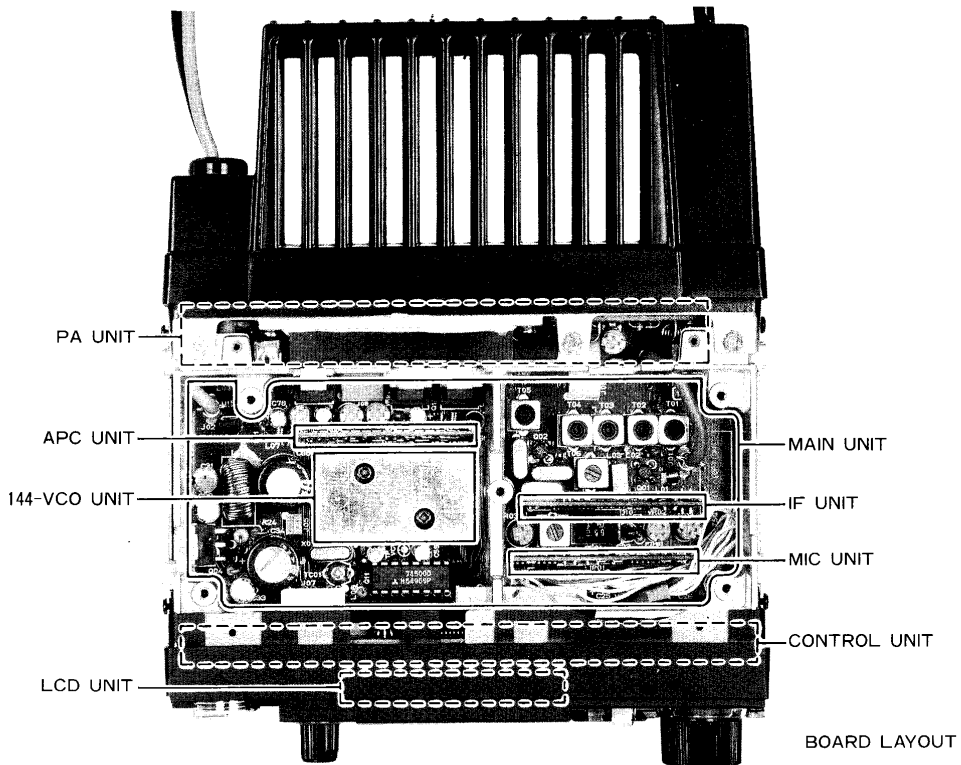
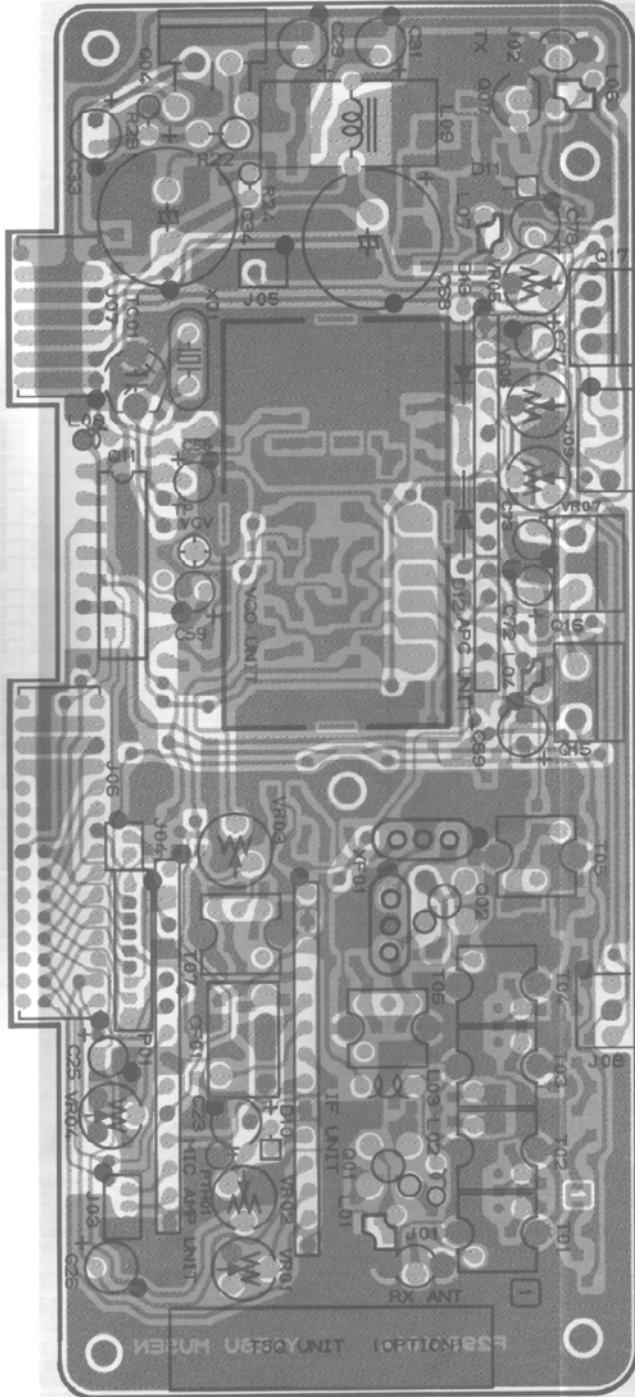


Figure 3

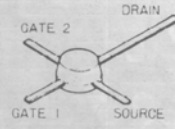


# MAIN UNIT PARTS LAYOUT

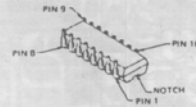
MAIN UNIT (No. 1XXX)



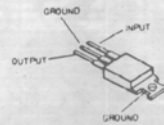
obverse view of "component" side



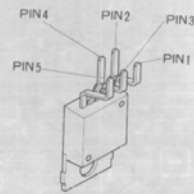
3SK81 (Q1002)  
3SK122L (Q1001)



M54959P(Q1011)

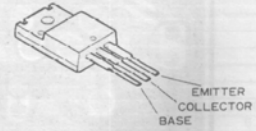
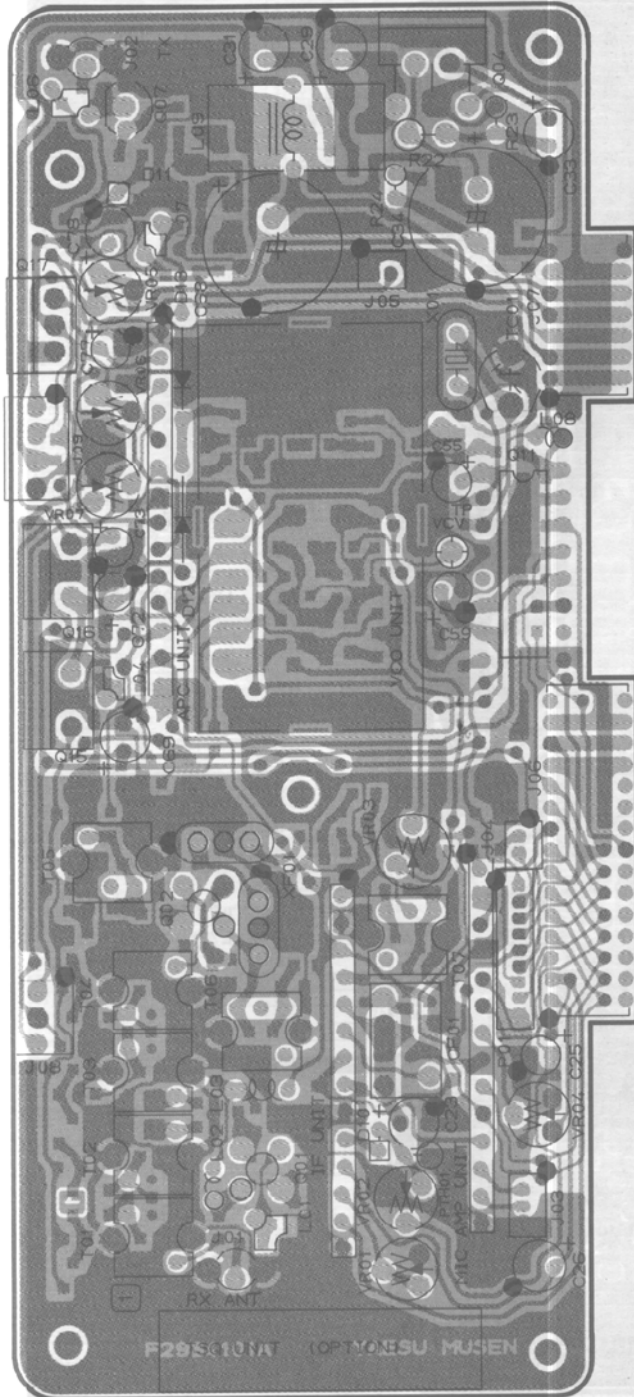


μPC7805H (Q1015)  
L7809 (Q1016)

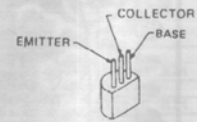


TDA2003 (Q1004)

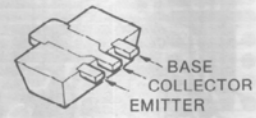
# MAIN UNIT PARTS LAYOUT



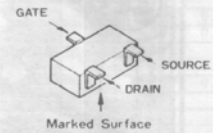
2SB1134R (Q1017)



2SC2538 (Q1007)



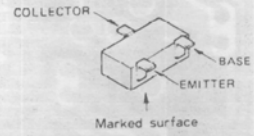
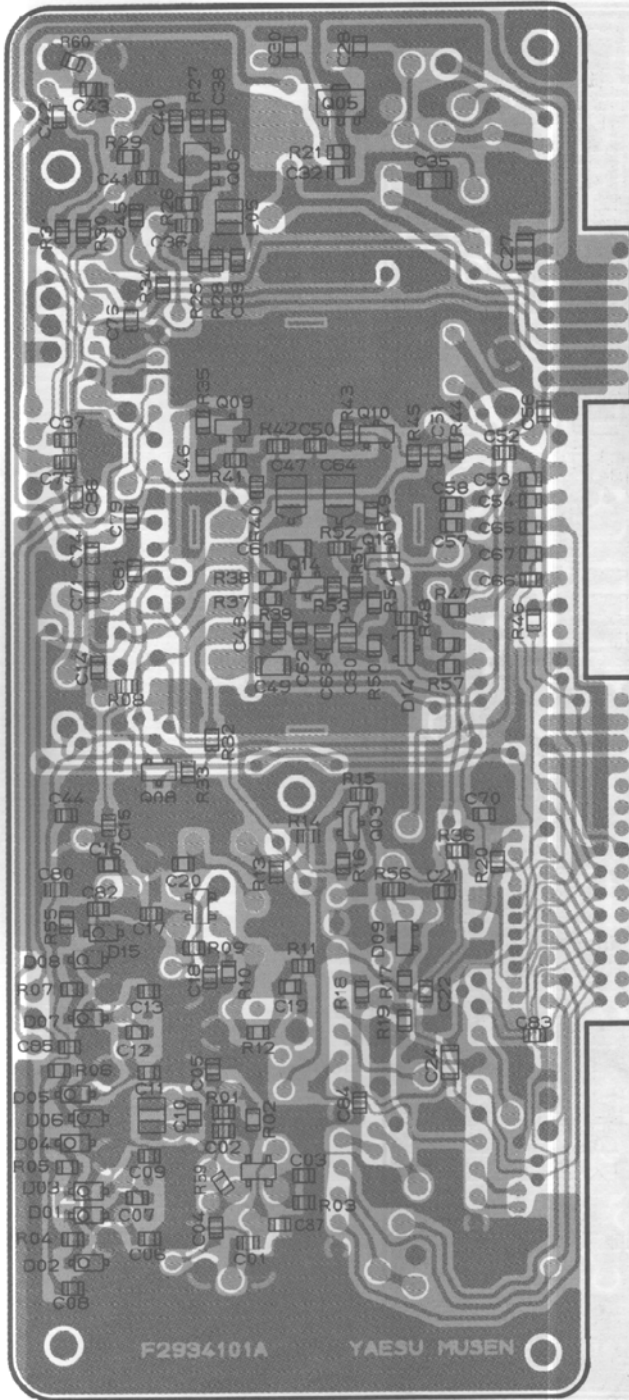
2SD1000(LL) (Q1005)  
2SC3357(RK) (Q1006)



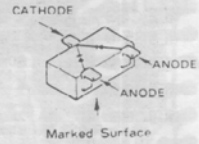
2SK209GR(XG) (Q1008)  
2SK208Y (JY) (Q1013)

reverse view of "component" side

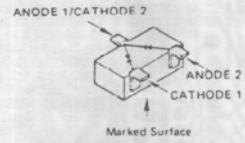
# MAIN UNIT PARTS LAYOUT



2SC2620(QB)  
(Q1003,1009,1010)  
2SC1623(L7) (Q1014)



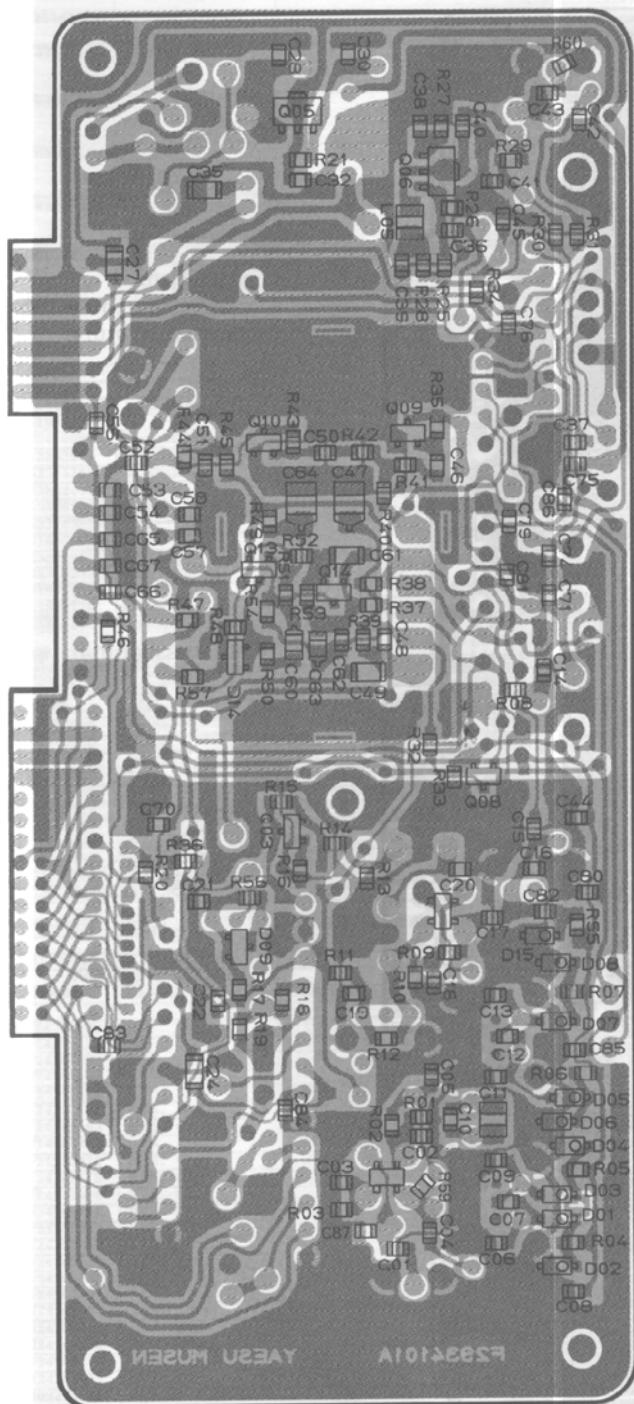
1SS184(B3) (D1014)



1SS226(C3) (D1009)

obverse view of "chip-only" side

# MAIN UNIT PARTS LAYOUT



reverse view of "chip-only" side



# MAIN UNIT PARTS LAYOUT

## MAIN UNIT VOLTAGE CHART

(DC VOLTS)

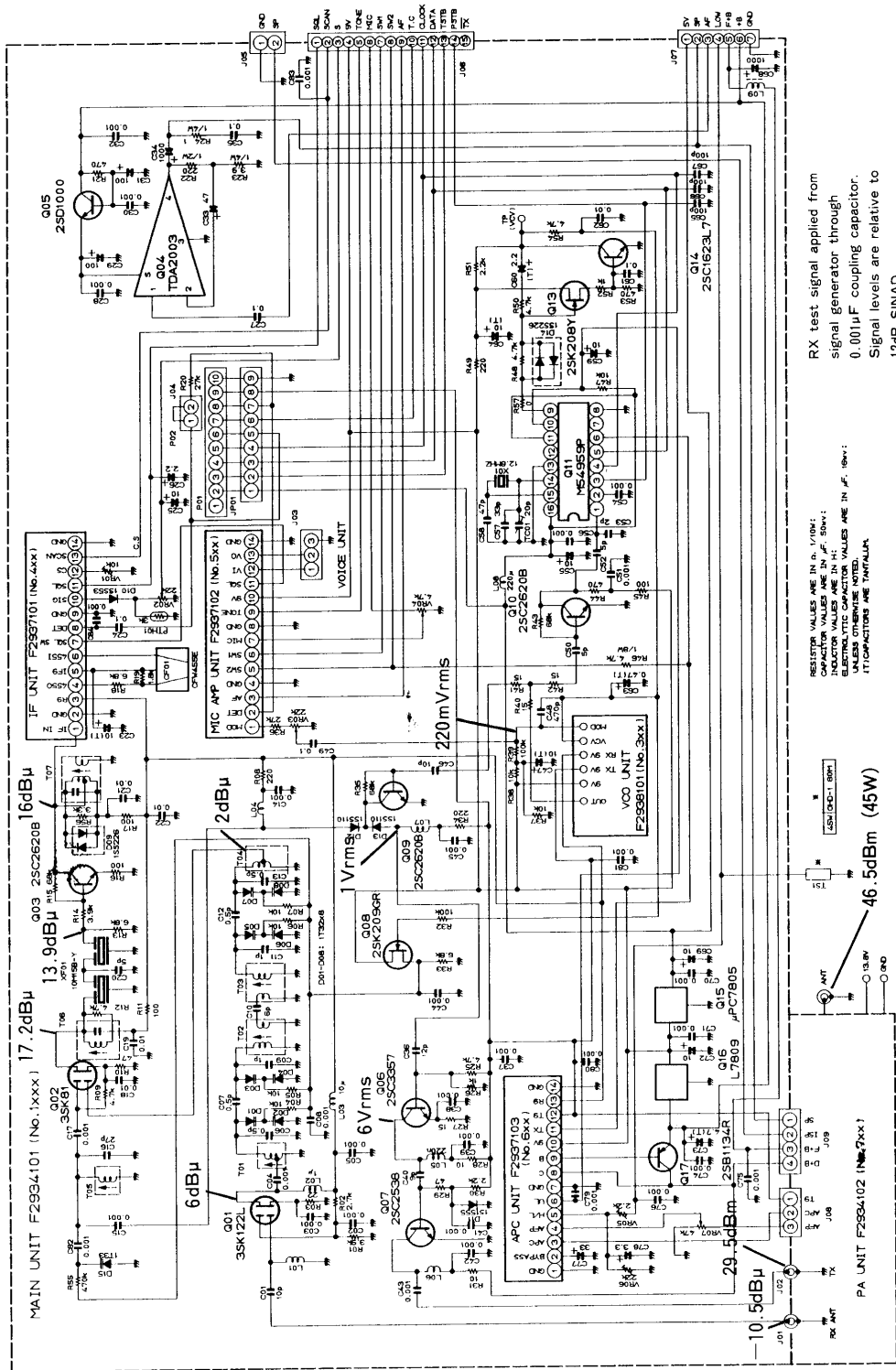
Symbol No.	E(S)	C(D)	B(G1)	G2	REMARKS
Q1001	0.2	9.0	0	5.2	
Q1002	0.18	8.60	0	0.15	
Q1003	0.2	8.8	0.8		
Q1005	12.8	13.6	13.6		
Q1006	0.6	8.5	1.0		
Q1007	0	11.80/3.50	0.55/0.55		RF POWER HIGH/LOW
Q1008	13.8	9.0	13.8		
Q1009	0	6.5	0.7		
Q1010	0	5.4	0.7		
Q1013	13.8	8.0	13.8		
Q1014	0	13.8	0.6		
Q1017	12.4/13.6	12.4/0	11.2/13.2		RX/TX

## MAIN UNIT IC VOLTAGE CHART

(DC VOLTS)

PIN No. Symbol No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	REMARKS
Q1004	0.7	0.7	0	6.4	13.6												
Q1011	2.3	2.6	4.4	0	0	0/3.6	0	0	1.5	0	4.6	0	0	2.0	2.0	4.6	RX/TX
Q1015	13.6	0	9.0														
Q1016	9.0	0	5.0														

# MAIN UNIT CIRCUIT DIAGRAM

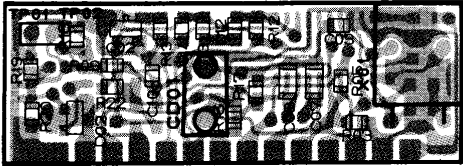


RESISTOR VALUES ARE IN  $\Omega$ ,  $\text{k}\Omega$ ,  $\text{M}\Omega$ .  
 INDUCTOR VALUES ARE IN  $\mu\text{H}$ ,  $\text{mH}$ ,  $\text{H}$ .  
 ELECTROLYTIC CAPACITOR VALUES ARE IN  $\mu\text{F}$ ,  $100\mu\text{F}$ .  
 VALUES OTHERWISE SPECIFIED  
 IN PARALLELS ARE TYPICAL.

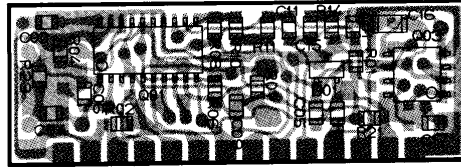
RX test signal applied from  
 signal generator through  
 0.001  $\mu\text{F}$  coupling capacitor.  
 Signal levels are relative to  
 12dB SINAD.

# IF UNIT PARTS LAYOUT/CIRCUIT DIAGRAM

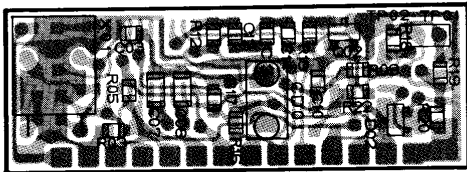
IF UNIT (No. 4xx)



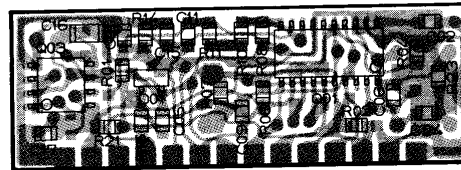
obverse view of "mixed-component" side



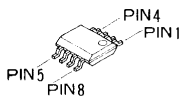
obverse view of "chip-only" side



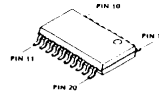
reverse view of "mixed-component" side



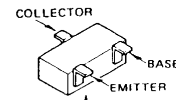
reverse view of "chip-only" side



M5223FP (Q403)



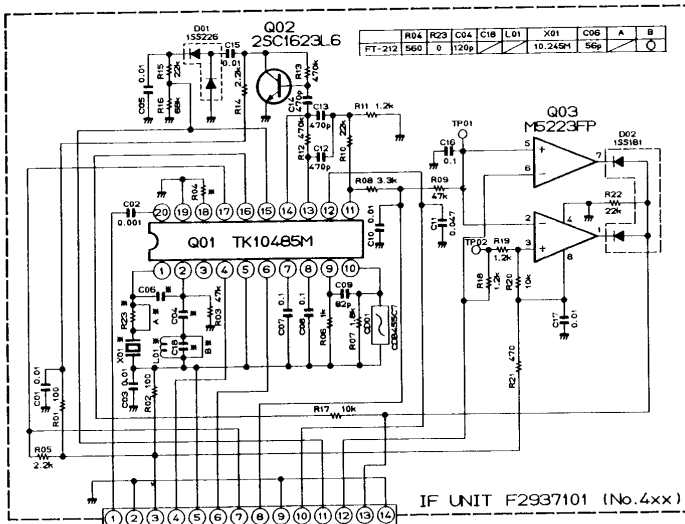
TK10487M (Q401)



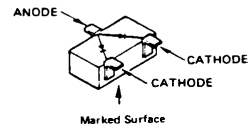
2SC1623(L6) (Q402)

## IF UNIT VOLTAGE CHART (DC VOLTS)

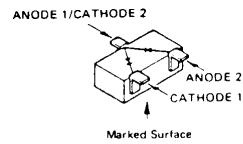
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	REMARKS	
FM IN	GND	Rx 9V	45.0V	IF 9	45 V	SOL SW	DET	GND	SIG	SOL	CS	SCAN	GND								
8.7/0	0	9.0/0	8.0/0	8.4/0	6.6/0	50.0V 50.0M 0V 74.0	3.2/0	0		02-16/10	2.7/0	50.0V 50.0M 50V 50M	0								RX/TX



RESISTOR VALUES ARE IN Ω, 1/10Ω;  
CAPACITOR VALUES ARE IN μF, 50V;  
INDUCTOR VALUES ARE IN H;  
UNLESS OTHERWISE NOTED.



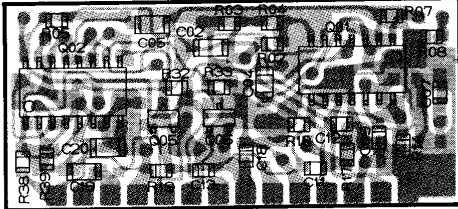
1SS181(A3) (D402)



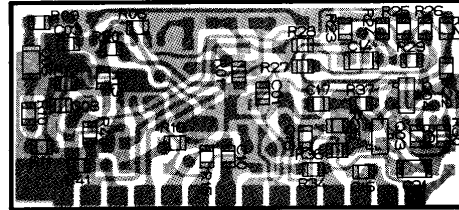
1SS226(C3) (D401)

# MIC UNIT PARTS LAYOUT/CIRCUIT DIAGRAM

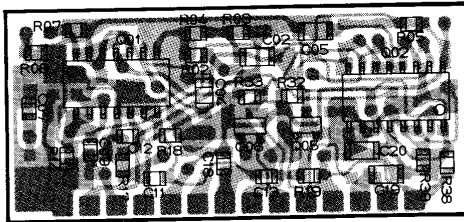
MIC UNIT (No. 5 × X)



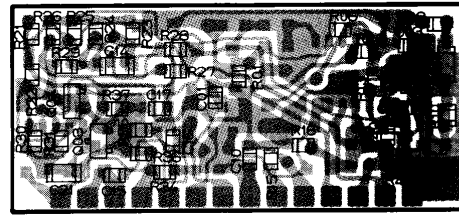
obverse view of "IC" side



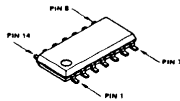
obverse view of "chip-only" side



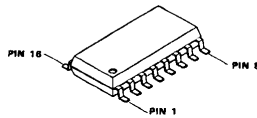
reverse view of "IC" side



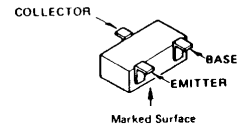
reverse view of "chip-only" side



LA6324M (Q501)



μPD4052BG (Q502)

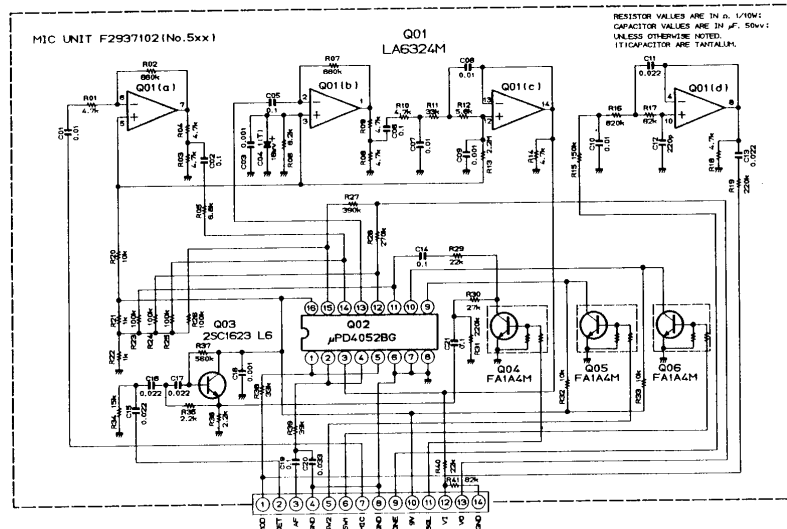


2SC1623(L6) (Q503)  
FA1A4M-T2B (L33)  
(Q504-506)

## MIC UNIT VOLTAGE CHART

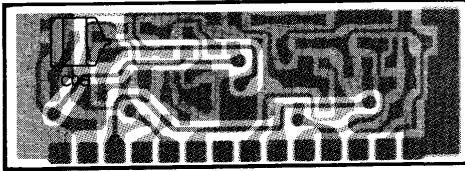
(DC VOLTS)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	REMARKS
MOD	DET	AF	GND	SW2	SW1	MIC	GND	9V	TONE	SOL	V1	V0	GND	RX/TX
0/2.1			0	0/4.3	0	0	0	1.6/1.6	9.0/9.0	0	3.0/3.0	3.0/9.0	0	

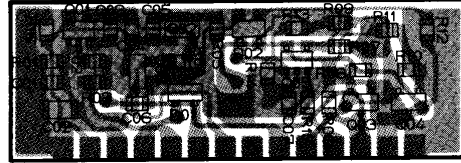


# APC UNIT PARTS LAYOUT/CIRCUIT DIAGRAM

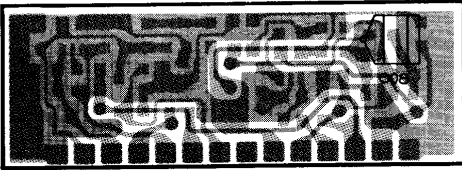
## APC UNIT (No. 6XX)



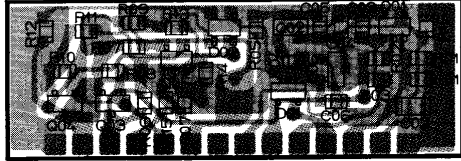
obverse view of "Tantalum CAP" side



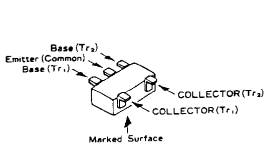
obverse view of "chip-only" side



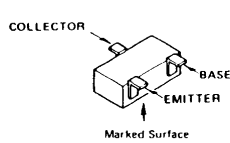
reverse view of "Tantalum CAP" side



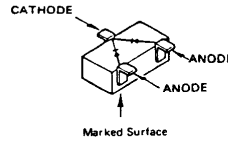
reverse view of "chip-only" side



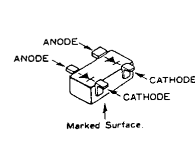
FMS1(S1) (Q601)  
FMW1(W1) (Q605)



2SB624(BV4) (Q603, Q604)  
2SC1623(L6) (Q602)  
FA1A4M-T2B(L33) (Q606)



1SS184(B3) (D601)

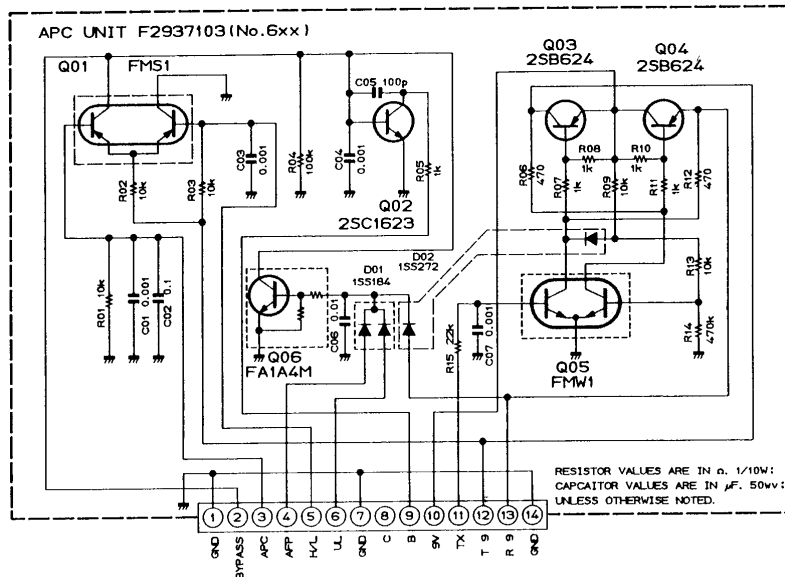


1SS272(A1) (D602)

### APC UNIT VOLTAGE CHART

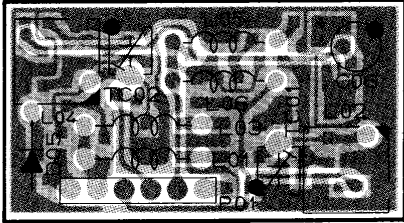
(DC VOLTS)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	REMARKS
GND	BYPASS	APC	AFF	H/L	UL	GND	C	B	9V	TX	T9	R9	GND	
0	0/0,6	0/5,7	0	0/1,2 0/1,2	0,1/0,1	0	0/3,7	13,6/13,2	9,0/9,0	0/3,6	0/9,0	9,0/0	0	RX/TX

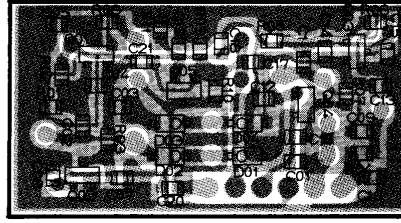


# 144-VCO UNIT PARTS LAYOUT/CIRCUIT DIAGRAM

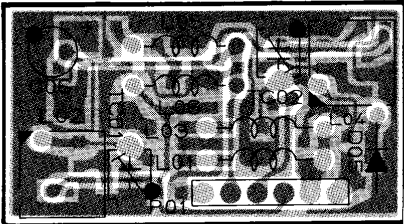
144-VCO UNIT (No. 3XX)



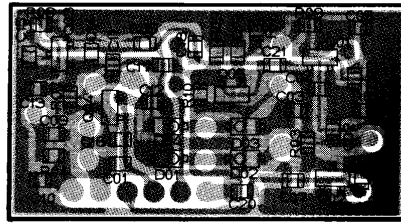
obverse view of "component" side



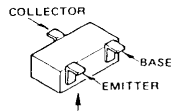
obverse view of "chip-only" side



reverse view of "component" side



reverse view of "chip-only" side



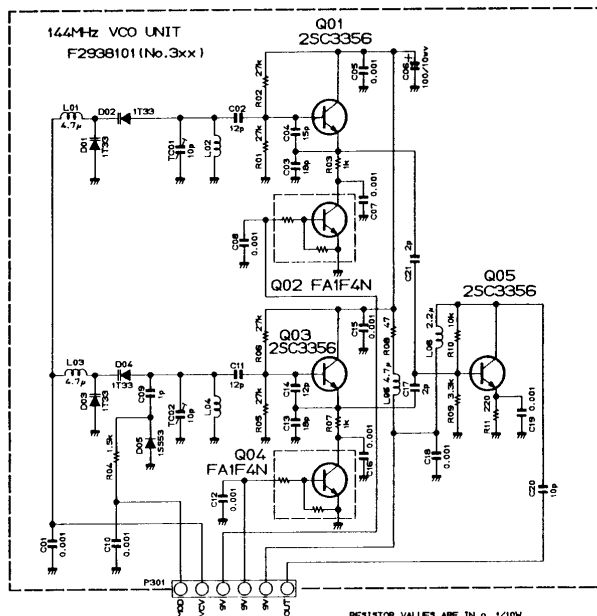
Marked Surface

- 2SC3356(R24)  
(Q301,303,305)
- FA1F4N-T2B(R24)  
(Q302,304)

## VCO UNIT VOLTAGE CHART

(DC VOLTS)

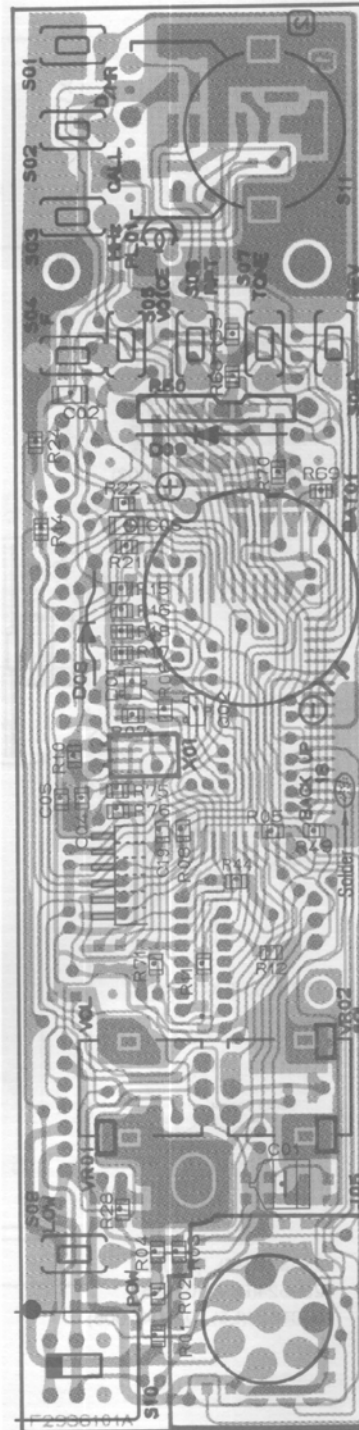
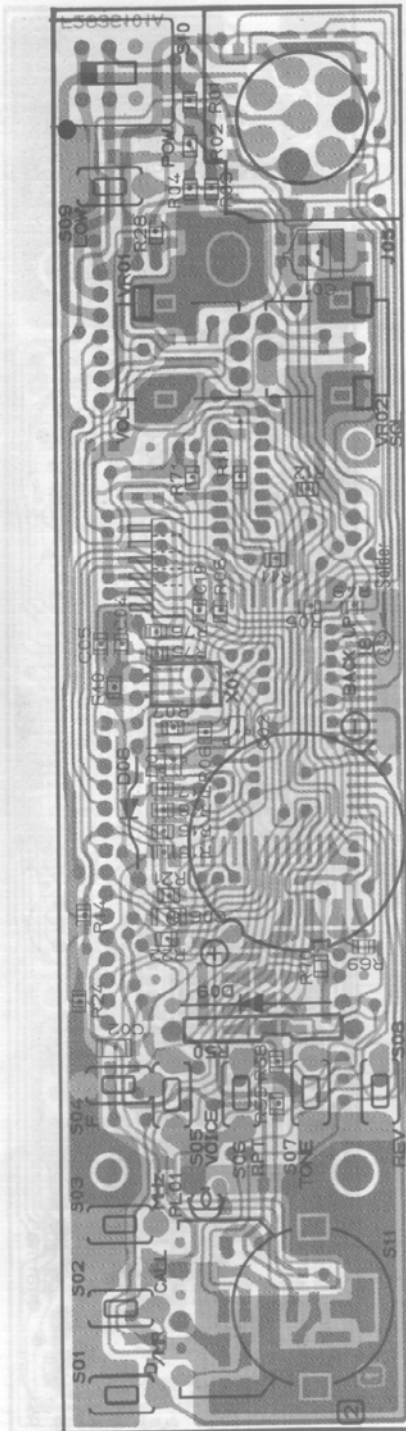
MOD	VCV	R9	T9	9	OUT	REMARKS
3.6		9.0/0	0/9.0	9.0	0	RX/TX



RESISTOR VALUES ARE IN Ω, 1/10W  
CAPACITOR VALUES ARE IN μF, 50V  
INDUCTOR VALUES ARE IN H; UNLESS OTHERWISE NOTED.

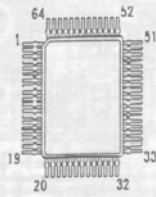
# CONTROL UNIT PARTS LAYOUT

CONTROL UNIT (No. 2XXX)

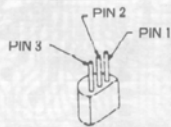
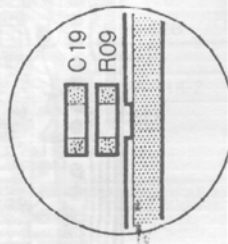


obverse view of "mixed-component" side    reverse view of "mixed-component" side

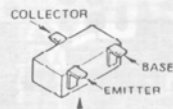
# CONTROL UNIT PARTS LAYOUT



HD404418A01F (U20U3)

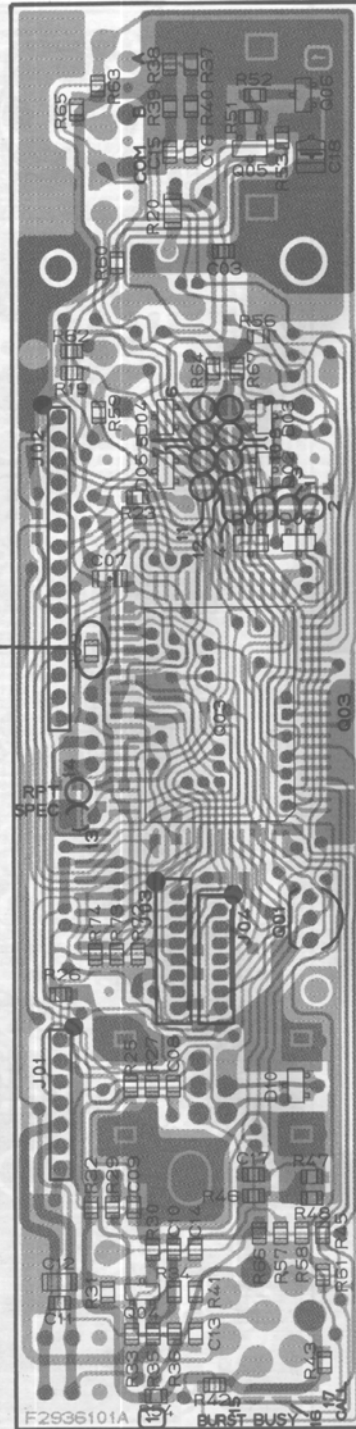


PST5230-2 (Q2001)



Marked Surface

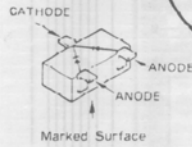
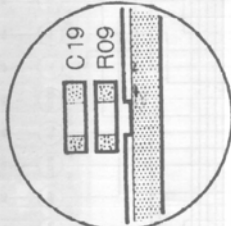
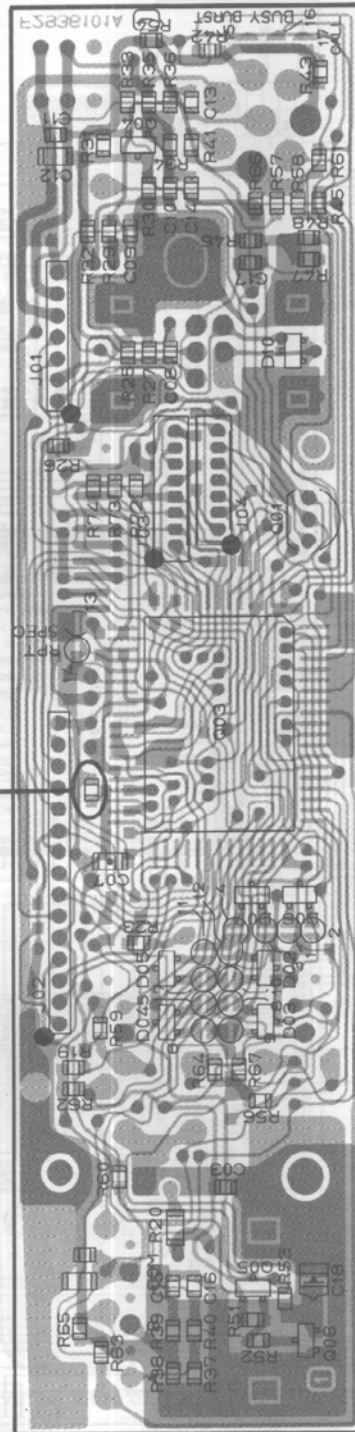
- 2SA812(M6) (Q2002)
- 2SB624(BV4) (Q2005)
- 2SC1623(L6) (Q2004,2006)



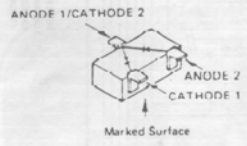
obverse view of "IC" side



# CONTROL UNIT PARTS LAYOUT



1SS184(B3)  
 (D2002,2003,2004)  
 2005,2006,2007  
 2010



1SS226(C3) (D2001)

obverse view of "IC" side