

# FT-211RH

## TECHNICAL SUPPLEMENT

**SCHEMATHEEK**

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*Postbus 4228*

*5604 EE Eindhoven*

This booklet contains supplemental technical information related to the FT-211RH for use with the FT-211RH Operating Manual. Service or repairs to the FT-211RH transceiver should be performed by qualified technicians only.

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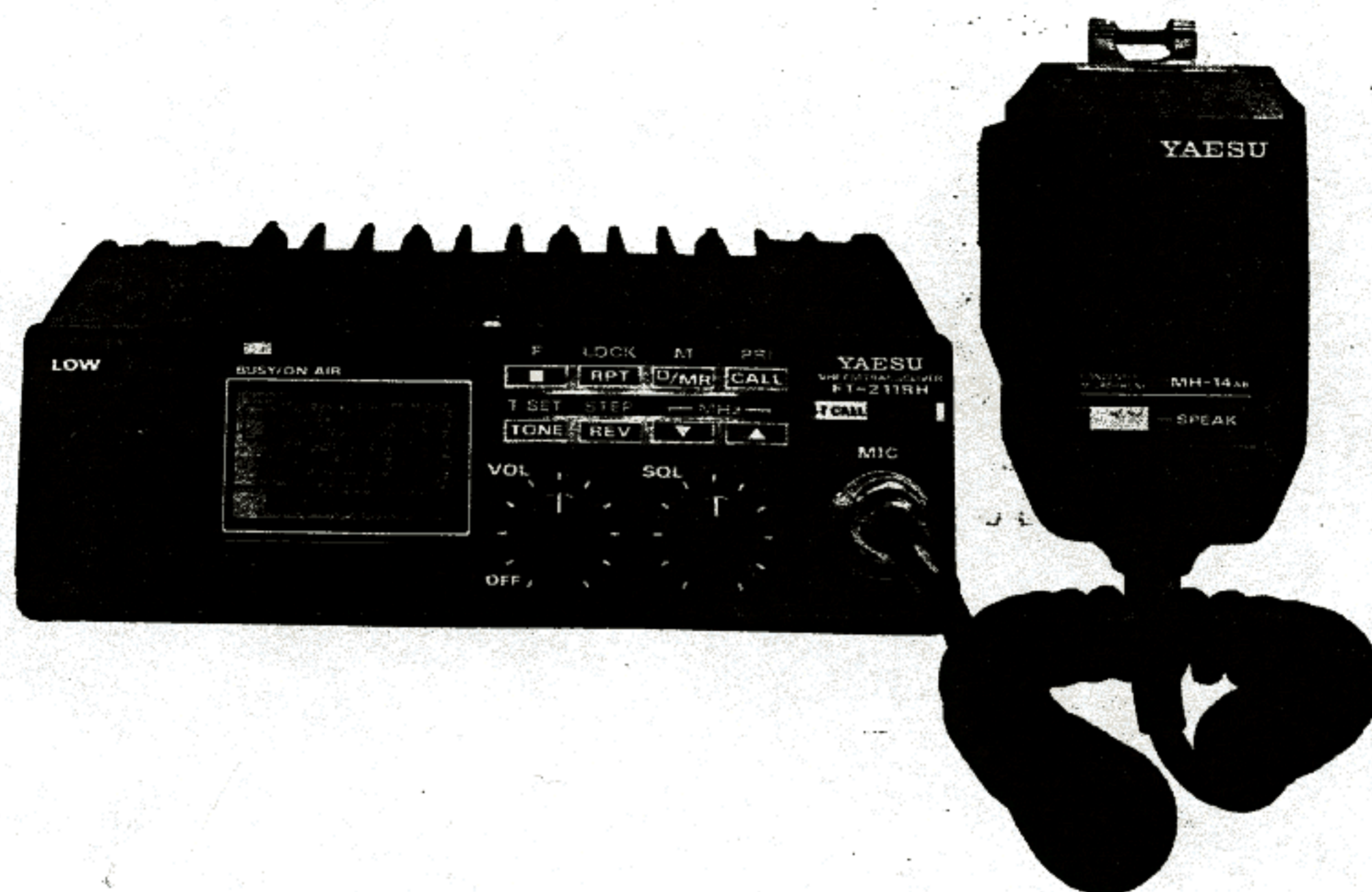
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**YAESU MUSEN CO., LTD.**  
**C.P.O. BOX 1500**  
**TOKYO, JAPAN**



# FT-211RH

## TECHNICAL SUPPLEMENT



This manual is intended to serve as a supplement to the FT-211RH 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.

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.



# CHIP COMPONENT INFORMATION

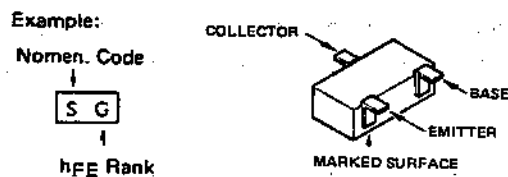
While chip components are generally more reliable and enduring than lead components, they are much more difficult to replace. The chip placement robots at the factory set the components into place on a small spot of resin adhesive before soldering, and this adhesive provides rigid mechanical support for the component independently of the solder joints. Once the resin has been cured there is no way to remove it. Therefore, to remove a chip component, it is necessary to first remove all of the solder at each connection and then forcefully break the adhesive bond. This must be done very carefully, both to avoid overheating the board and lifting tracks when desoldering, and to avoid damaging the

board or underlying tracks when breaking off the component. Removed components should never be reused, as they are bound to be unreliable after removal.

In spite of the following information on labelling, some chip components may have no markings at all (especially resistors and capacitors, indicated with asterisks "\*" below). In this case, to identify the component, refer to the part location in the layout diagrams, note the location number, and then refer to the Parts List to determine the value or nomenclature and type.

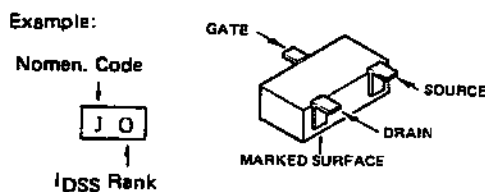
## Transistors

Location	Nomenclature	Mark
Q1012,1013,401	2SA812	M6/M7
Q1018,302,304 403,502,602 603,604,605 702,703,801	2SC1623	L6/L7
Q1003	2SC2620	QB
Q1006,1015,301 303	2SC3356	R22



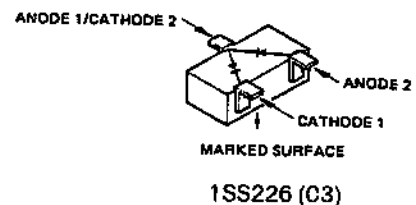
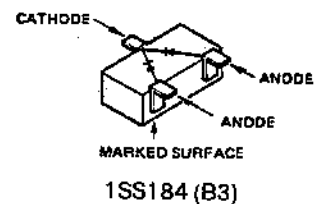
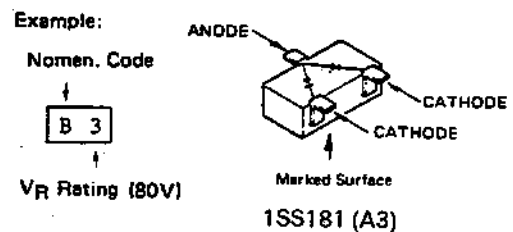
## FETs

Location	Nomenclature	Mark
Q601	2SK208Y	JY



## Diodes

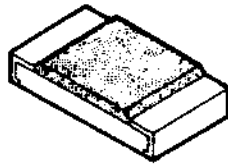
Location	Nomenclature	Mark
D701,903	1SS181	A3
D1022,901	1SS184	B3
D1003,1013,501 702	1SS226	C3



# Resistors

Type RMC 1/10W

Marking\* 100,222,473.....



## INDICATED LETTERS

1 2 3 4  
5 6 7 8  
9 0 .

473		
Ten unit	One unit	Multiplier code
0	0	$10^0$
1	1	$10^1$
2	2	$10^2$
3	3	$10^3$
4	4	$10^4$
5	5	$10^5$
6	6	$10^6$
7	7	$10^7$
8	8	$10^8$
9	9	$10^9$

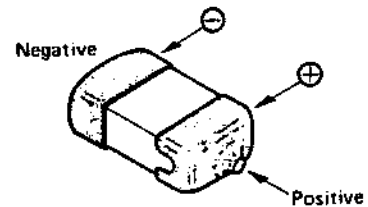
Examples :

100 = 10Ω

222 = 2.2kΩ

473 = 47kΩ

## Tantalum Capacitor



Polarized, Unmarked  
(determine value from layout  
and Parts List)

## CHIP SEMICONDUCTOR CROSS-REFERENCE

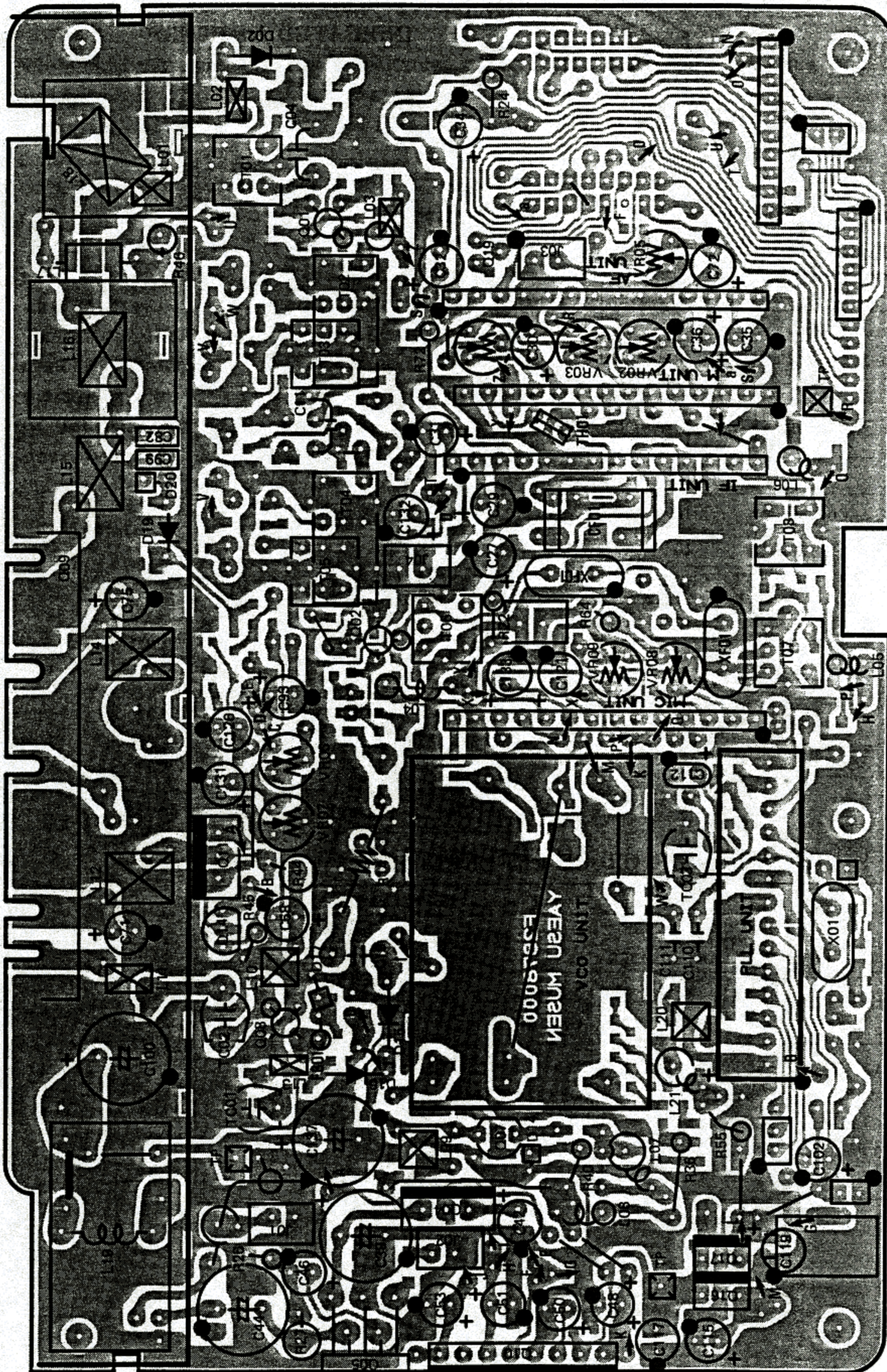
PART LOCATION NO.	ORIGINAL	REPLACEMENT	
	NOMENCLATURE (MARKING) AND PART NUMBER	NOMENCLATURE (MARKING) AND PART NUMBER	
Q1012,1013 401	2SA812 (M6/M7) G3108127F/G	2SA1162GR (S0) G3111627G	
Q1018,302 304,305,403 502,602,603 604,605,702 703,801	2SC1623 (L6/L7) G3316237F/G	2SC2712 (GR/BL) G3327127G/B	

\* Semiconductors not listed above may be replaced only with original types.

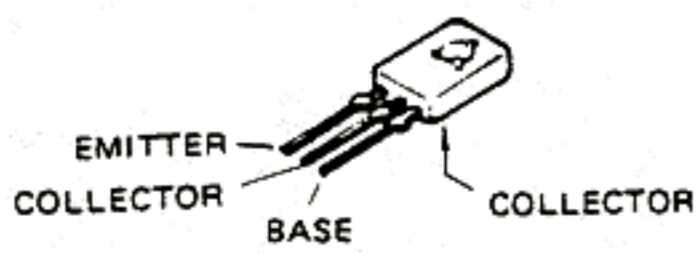


# MAIN UNIT

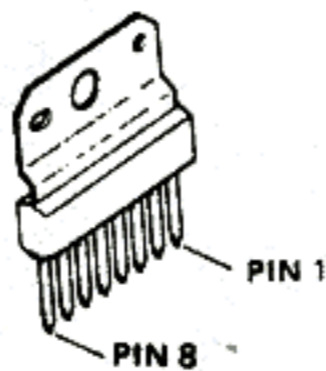
Schematheek  
Beh. T. Hultermans  
Postbus 4228  
5604 EE Eindhoven



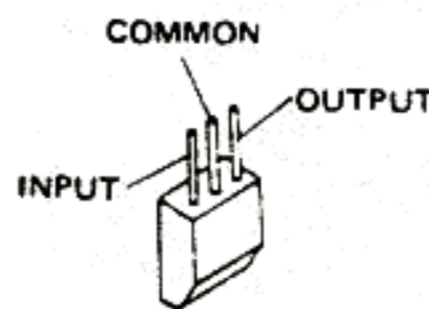
"component" side



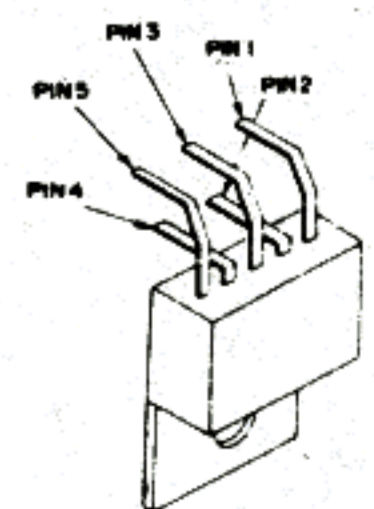
2SD882P (Q1004)



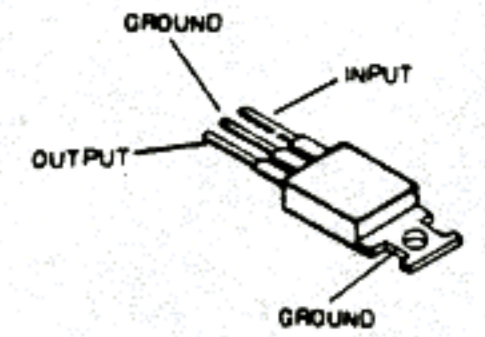
MB3756M (Q1010)



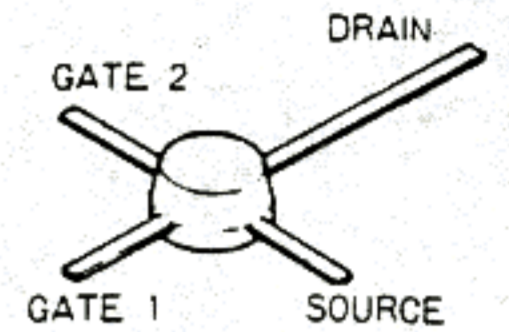
$\mu$  PC78L08 (Q1016)  
 $\mu$  PC78L05 (Q1017)



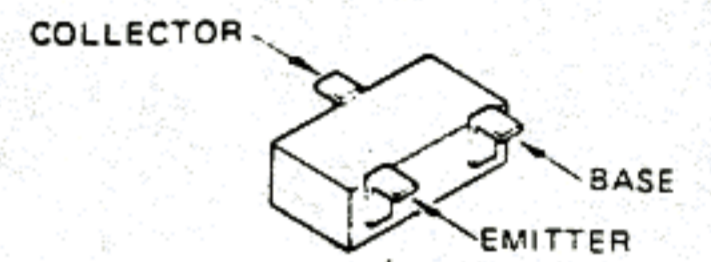
TDA2003 (Q1005)



$\mu$  PC7808H (Q1)

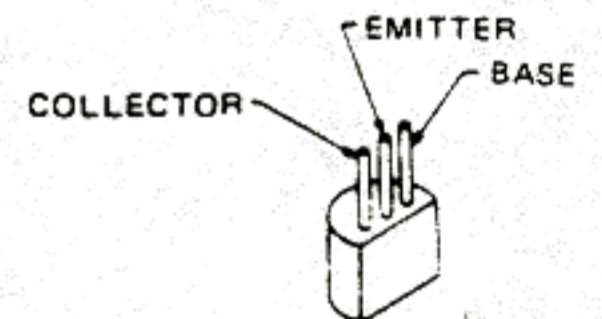


3SK122 (Q1002)  
3SK81 (Q1001)

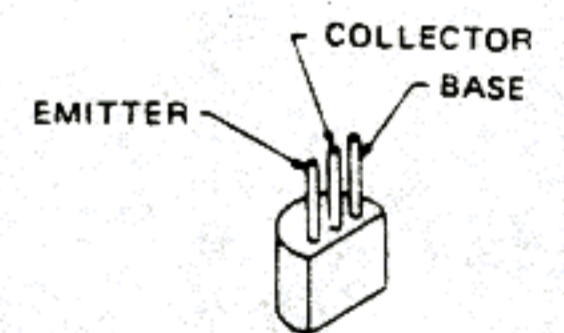


Marked surface

2SA812 (M6/M7) (Q1012,1013)  
2SC1623 (L6/L7) (Q1018)  
2SC620 (QB) (Q1003)  
2SC3356 (R22) (1006,1015)



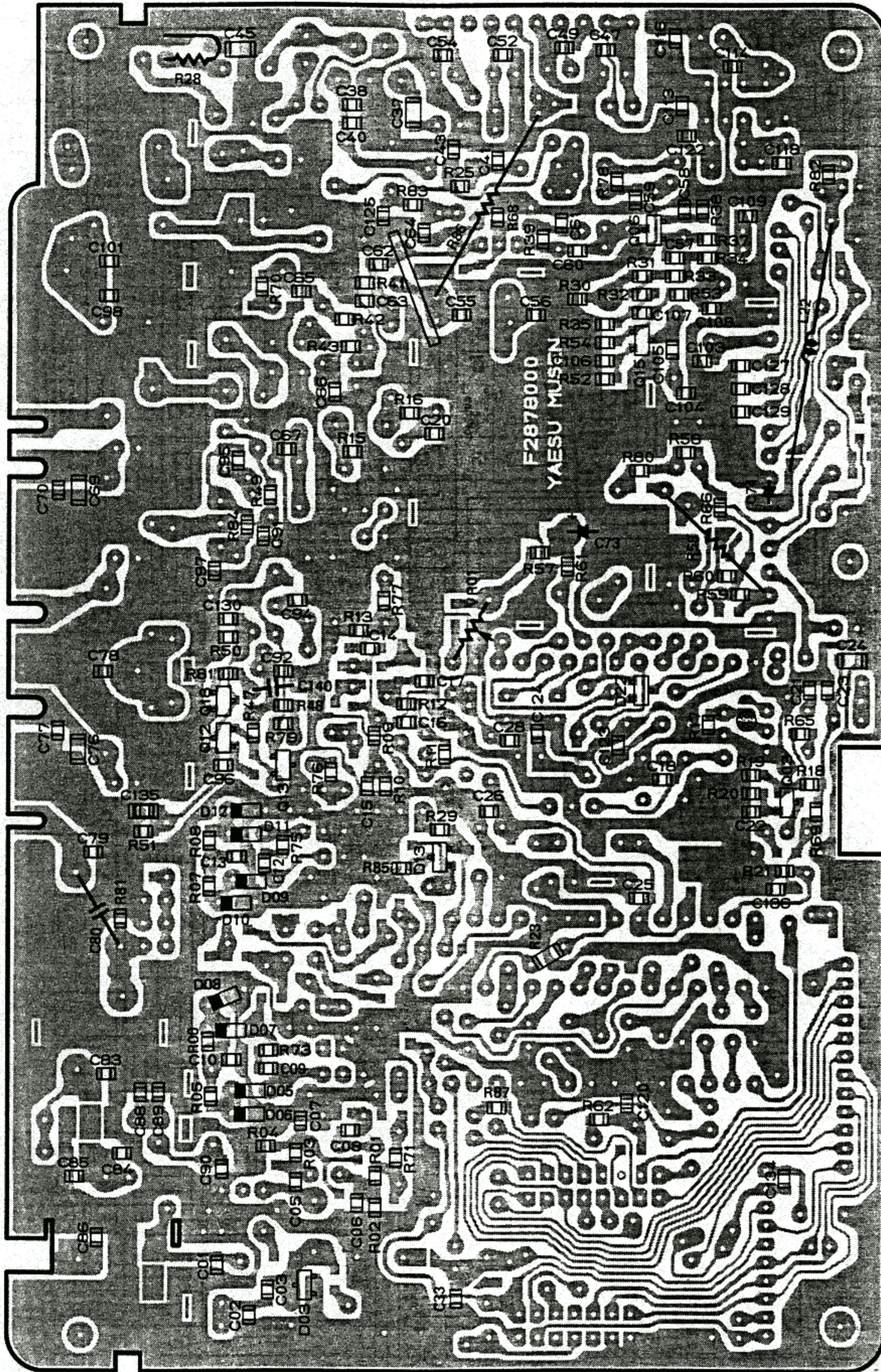
2SC3355 (Q1007)



2SC2538 (Q1008)

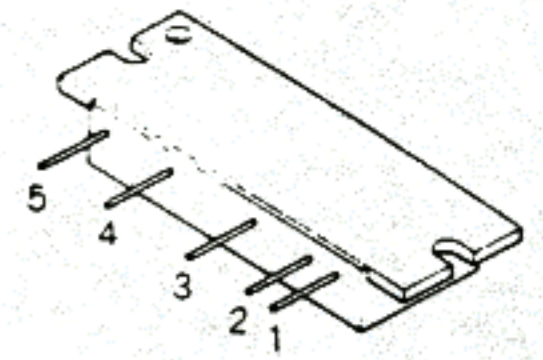


# MAIN UNIT

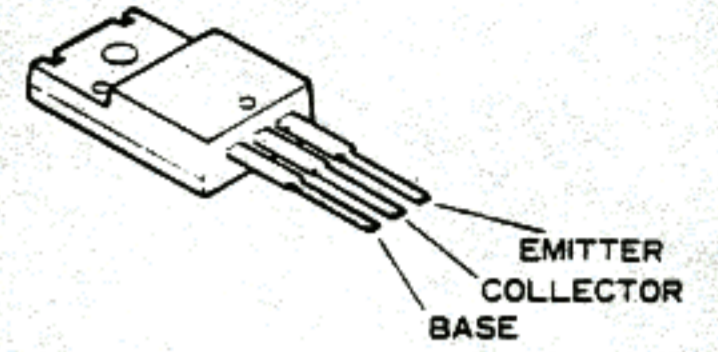


"chip" side

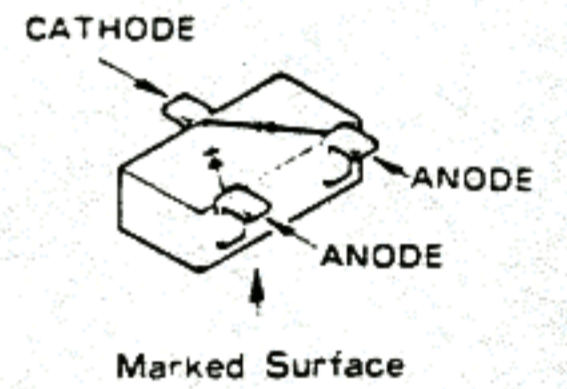
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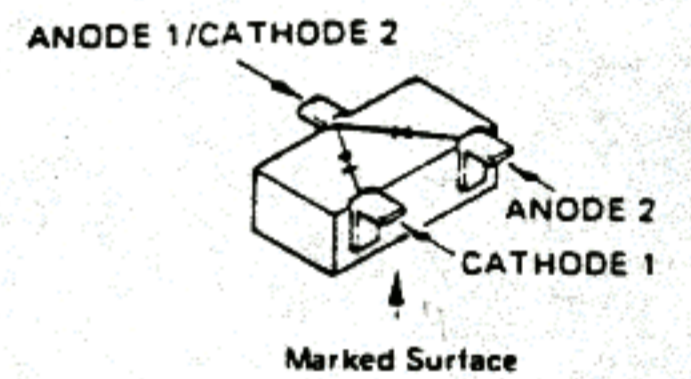
M57726 (Q1009)  
RF output 45W



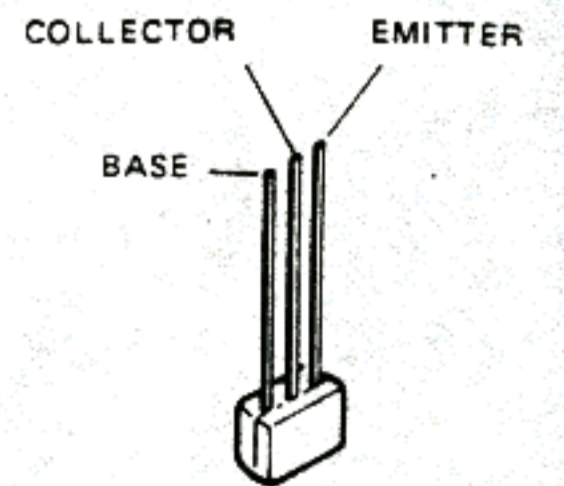
2SB942 (Q1011)



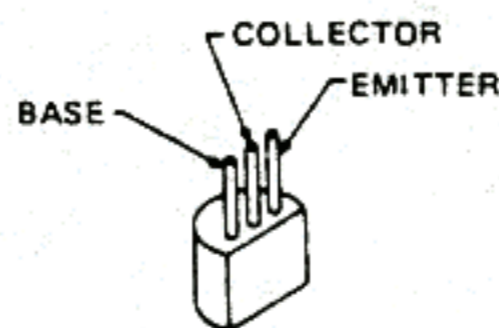
1SS184 (B3) (D1022)



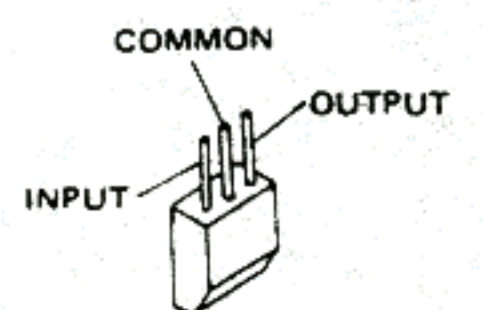
1SS226 (C3) (D1003,1013)



BN1A4M (Q1019)

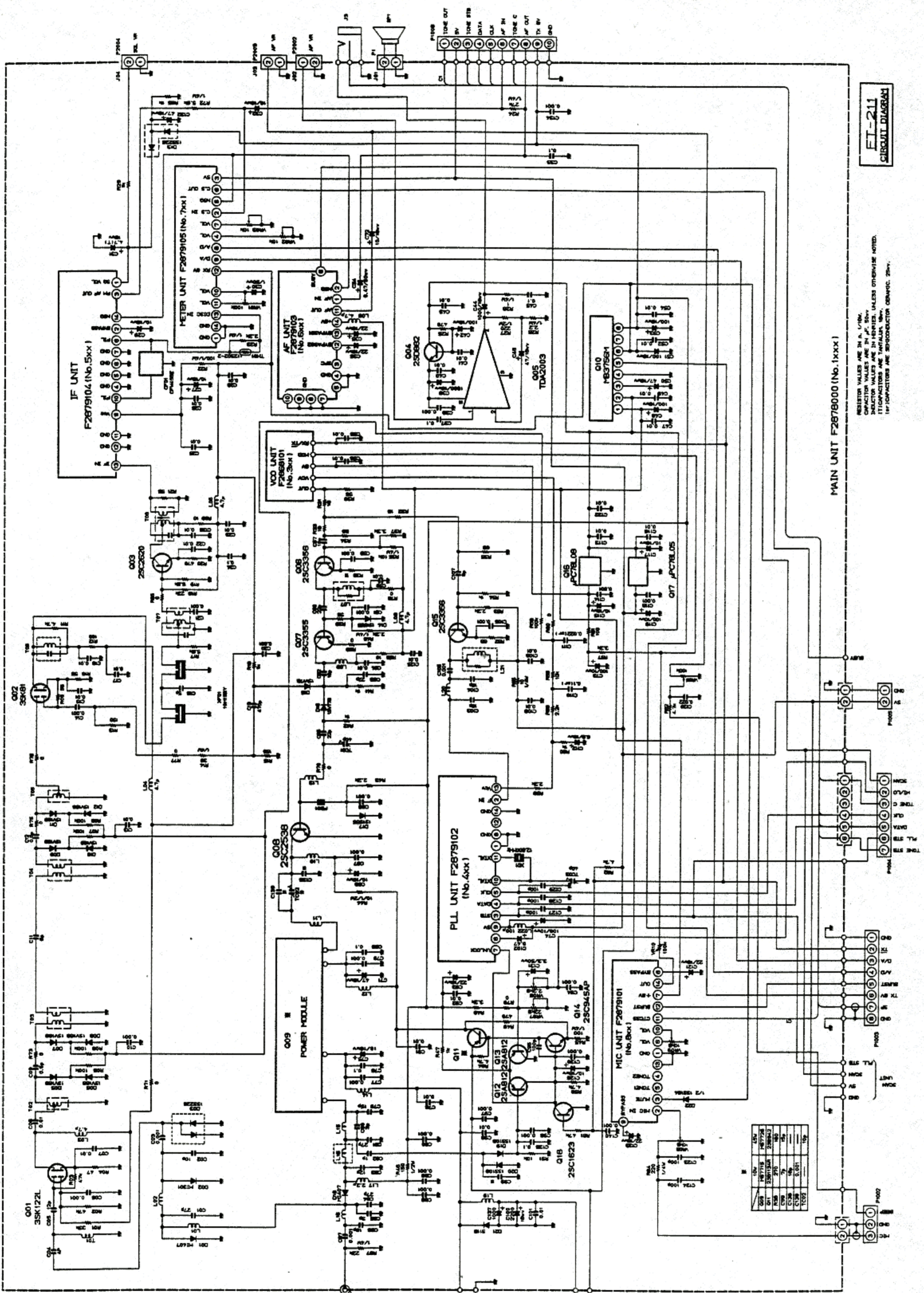


2SC945AP (Q1014)



μPC78L05 (Q1017)  
μPC78L08 (Q1016)





ET-211  
CIRCUIT DIAGRAM

MAIN UNIT F2878000 (No. 1xxx1)

RESISTOR VALUES ARE IN  $\Omega$ ,  $k\Omega$ ,  $M\Omega$ .  
CAPACITOR VALUES ARE IN  $\mu F$ ,  $nF$ ,  $pF$ .  
INDUCTOR VALUES ARE IN HENRIES, UNLESS OTHERWISE NOTED.  
IF CAPACITORS ARE TANTALUM,  $10^4$ .  
IF CAPACITORS ARE SEMICONDUCTOR,  $0.001$ ,  $20^4$ .

Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
3SK122L	3SK122L	2SC3620	2SC3620	2SC3355	2SC3355	2SC3355	2SC3355	2SC3355	2SC3355	2SC3355	2SA1225A	2SA1225A	2SC1623	2SC3454P	2SC3454P	2SC3454P	2SC3454P



# MAIN UNIT VOLTAGE CHART

## ICs

(DC VOLTS)

PIN No. Symbol No.	1	2	3	4	5	6	7	8	REMARKS
Q1005	1.0	0.8	0	6.0	12.0	—	—	—	
Q1009	0	13.6/12.5	13.6/13.2	0	—	—	—	—	
Q1010	8.2	13.6/12.5	8.2	0	5.0/0	8.2/0.2	0	0.2/8.2	RX/TX
Q1016	8.2	0	13.5	—	—	—	—	—	
Q1017	5.1	0	13.6	—	—	—	—	—	

## TRANSISTORS & FETS (DC VOLTS)

Symbol No.	E(S)	C(D)	B(G1)	G2	REMARKS
Q1001	0.8	8.2	0.8	4.6	
Q1002	0	8.0	0	0	
Q1003	1.0	8.1	1.8	—	
Q1004	12.8	13.6	13.6	—	
Q1006	1.0	8.0	1.8	—	
Q1007	0	8.0	0.6	—	
Q1008	0	0/7.2	0.3/0.5	—	RX/TX
Q1015	0.7	5.0	1.5	—	
Q1011	13.6/12.5	0/11.7	13.6/11.5	—	RX/TX
Q1012	0.3/4.6	0/4.6	0/4.0	—	RX/TX
Q1013	0.3/4.6	0	0/4.0	—	RX/TX
Q1018	0	0/4.6	0.6/0	—	RX/TX
Q1014	0/4.0	13.0/11.5	0/4.6	—	RX/TX

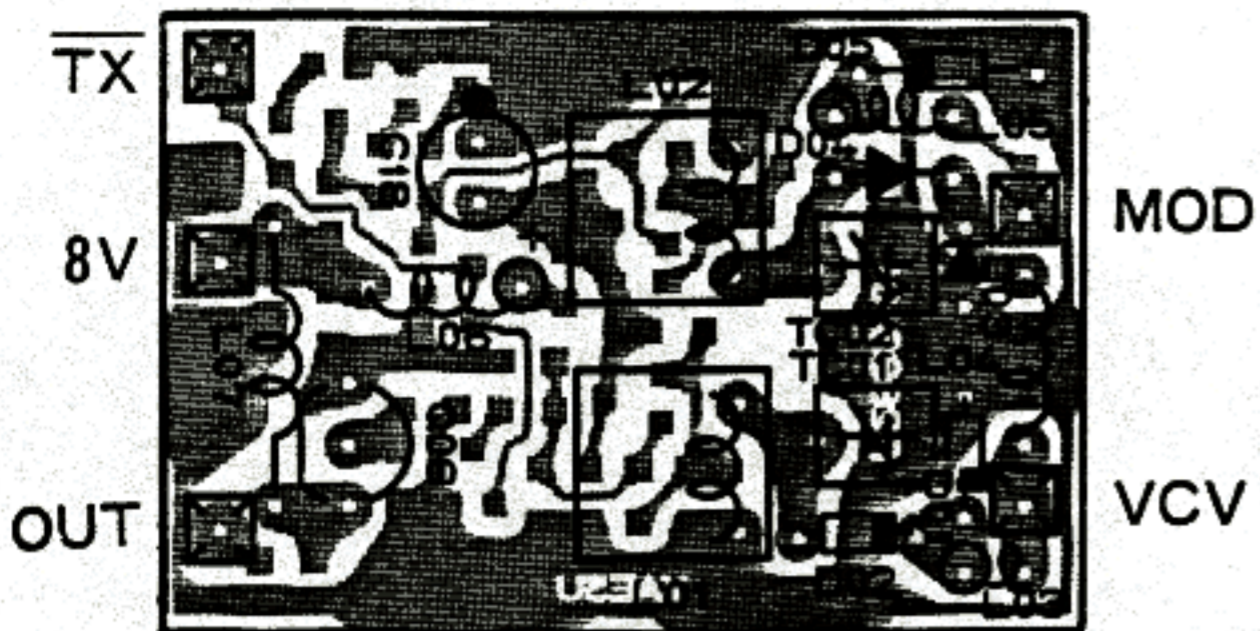
## CONNECTORS

(DC VOLTS)

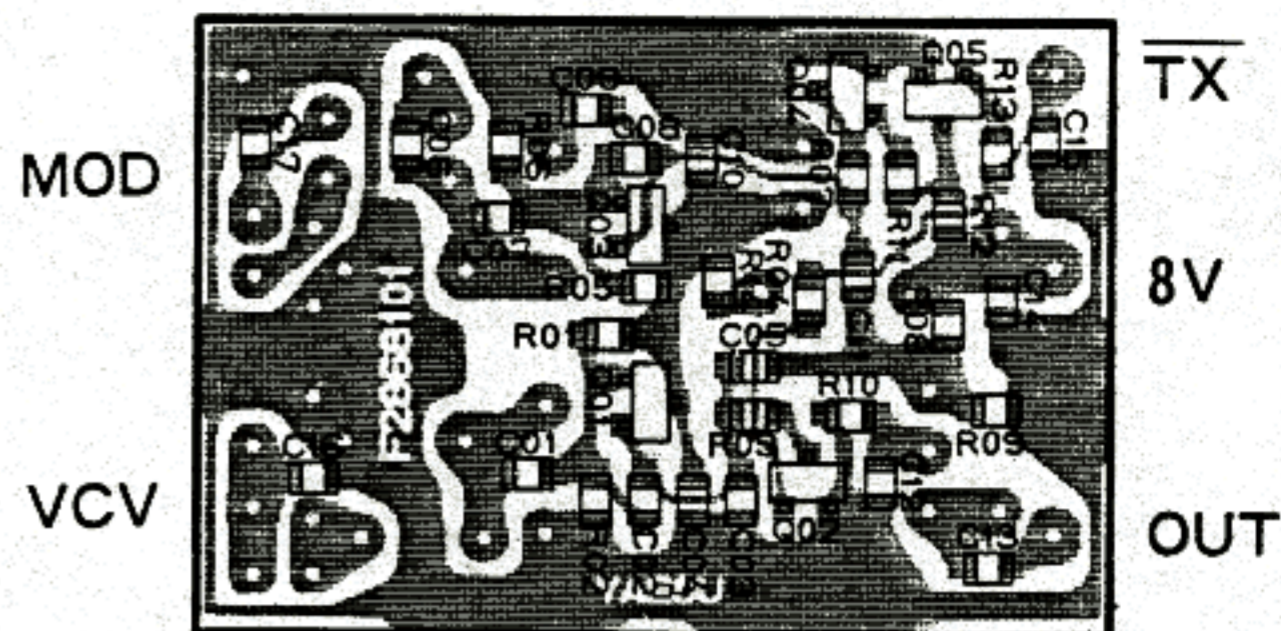
PIN No. Symbol No.	1	2	3	4	5	6	7	8	9	10	REMARKS
J1001	0	0	—	—	—	—	—	—	—	—	SQL VR min~max
J1002	0	0	—	—	—	—	—	—	—	—	
J1003	0	0	—	—	—	—	—	—	—	—	
J1004	0	0	—	—	—	—	—	—	—	—	
P1002	0	0	0	—	—	—	—	—	—	—	
P1003	0/0	4.6/0	—	—	0/0	0/8.0	0/0	0/0	—	—	RX/TX
P1004	0	13.6	—	—	—	—	—	—	—	—	RX/TX
P1005	5	0	—	—	—	—	—	—	—	—	
P1006	0/0	5/5	0/0	0/0	0/0	0/0	0/0	0/0	0/8	0/0	RX/TX



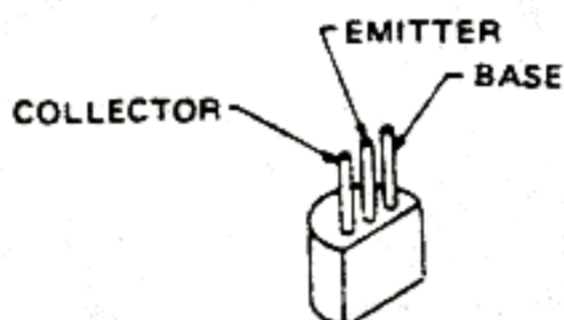
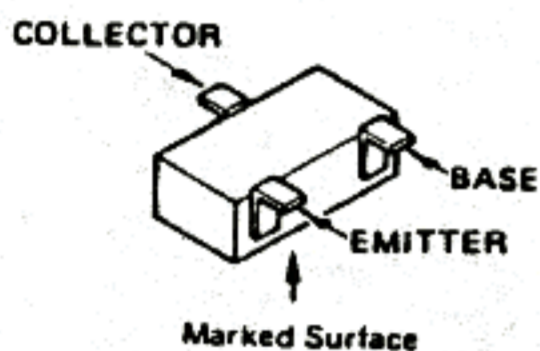
# VCO UNIT



"component" side



"chip-only" side



2SC1623 (L6/L7) (Q302,304,305)  
2SC3356 (R22) (Q301,303)

2SC3355 (Q306)

## VCO UNIT VOLTAGE CHART

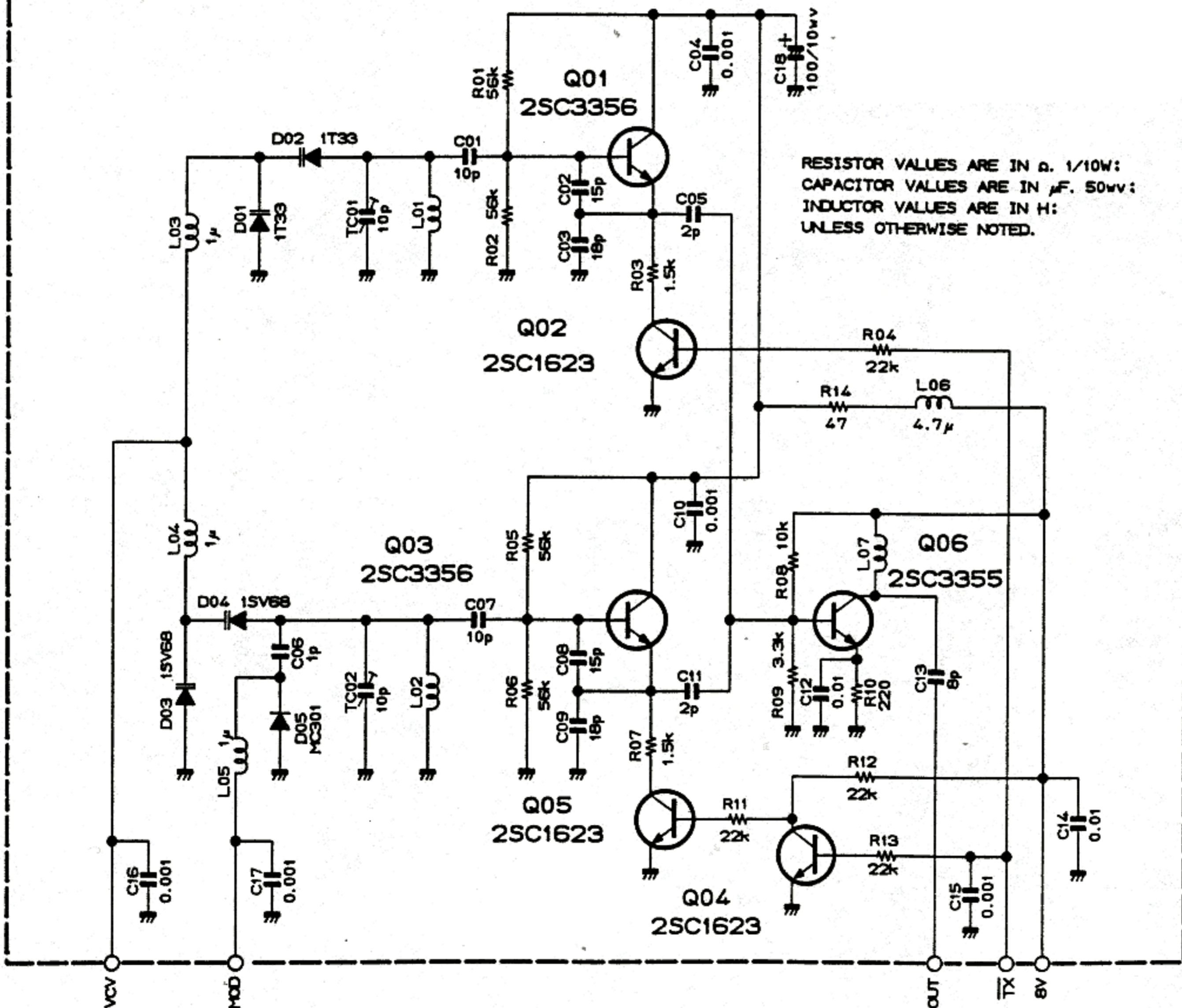
(DC VOLTS)

MOD	T $\bar{X}$	8V	REMARKS
4.5/4.5	0.1/4.15	8.1/8.1	RX/TX

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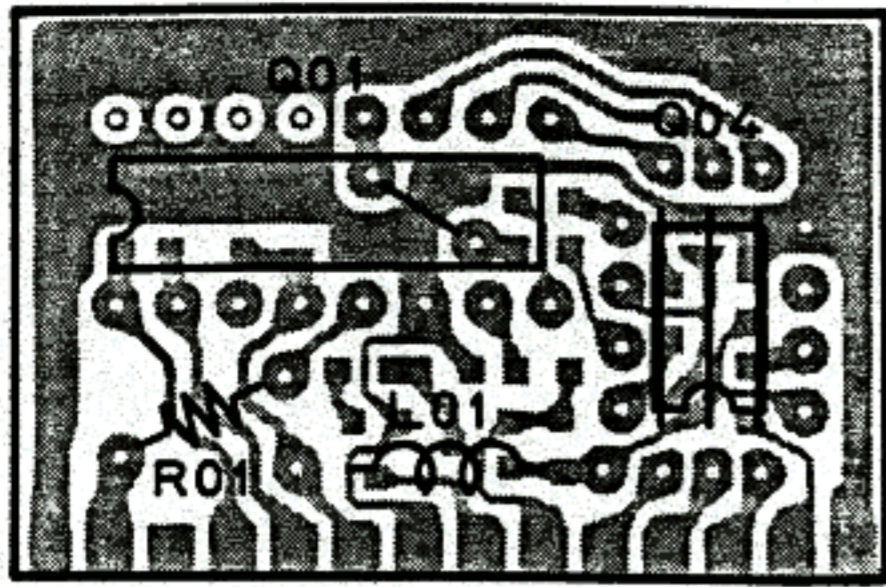
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## VCO UNIT F2868101 (No.3xx)



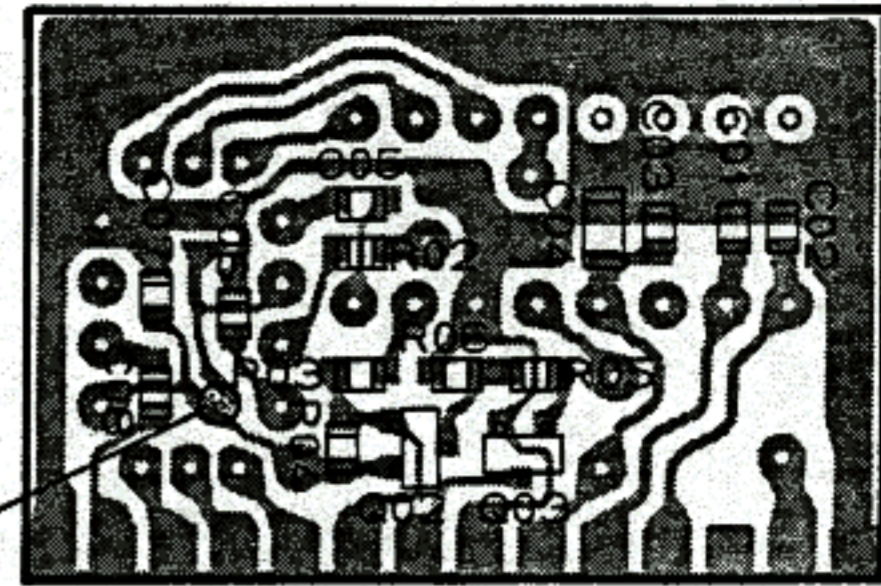


# PLL UNIT



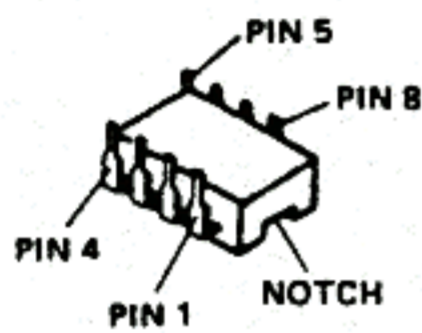
14 13 12 11 10 9 8 7 6 5 4 3 2 1

"component" side

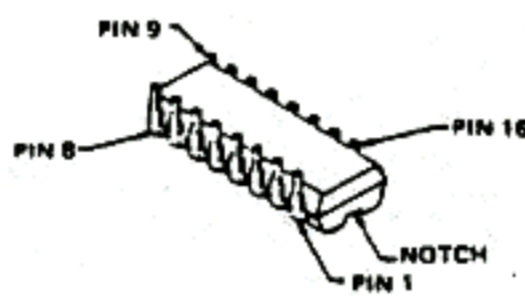


1 2 3 4 5 6 7 8 9 10 11 12 13 14

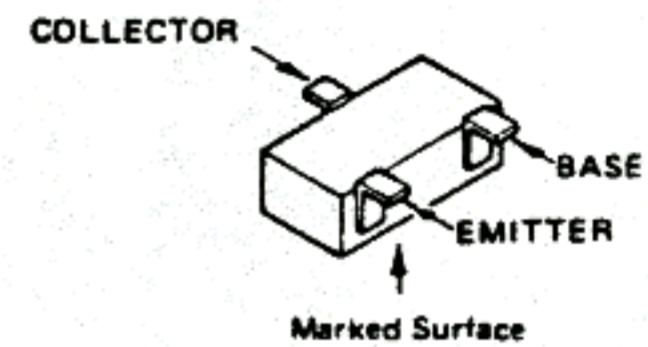
"chip-only" side



M54475P (Q404)



MC145158P (Q401)

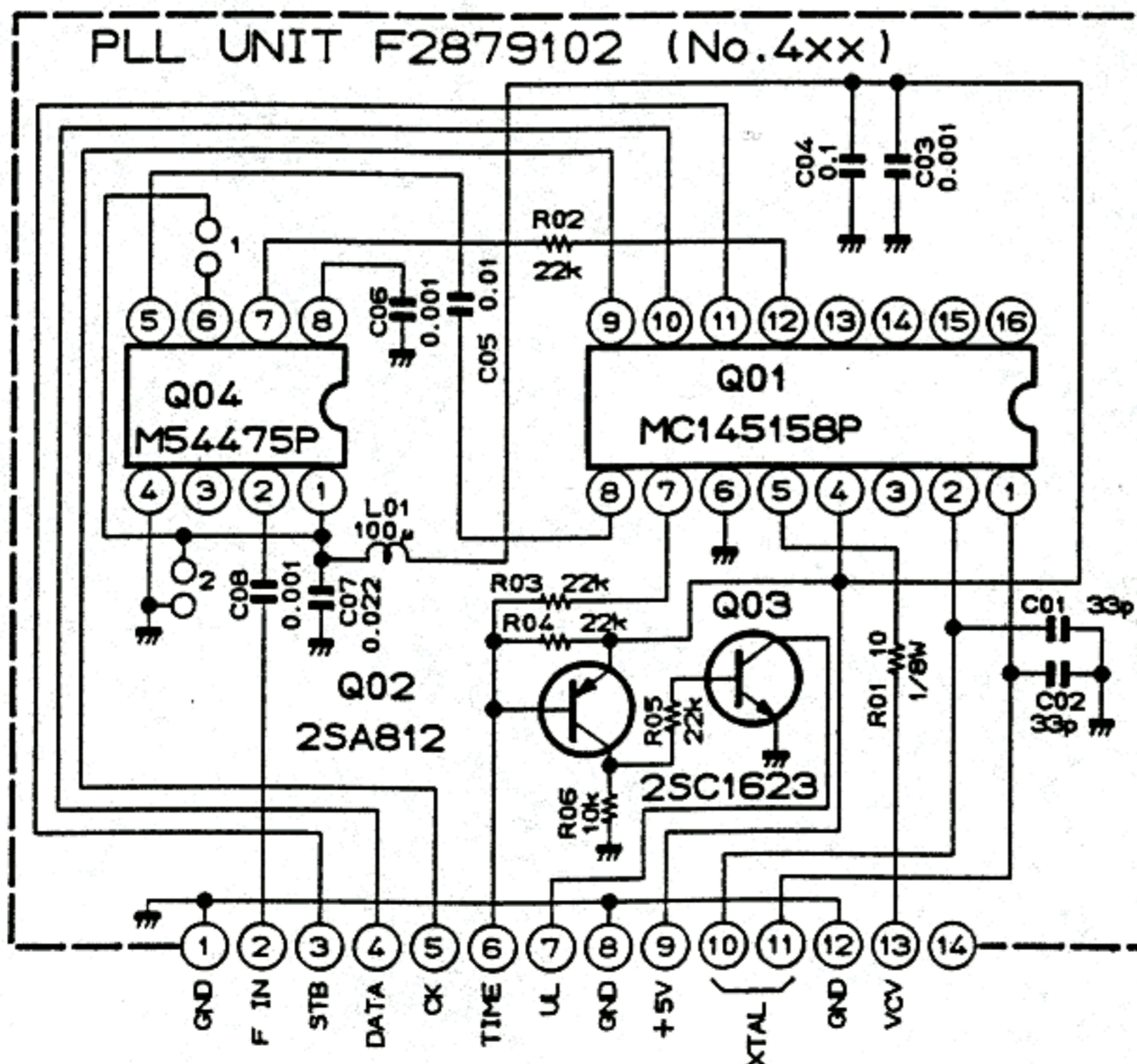


2SA1812 (M6) (Q401)  
2SC1623 (L6) (Q403)

## PLL UNIT VOLTAGE CHART

(DC VOLTS)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	REMARKS
GND	F IN	STB(P)	DATA	CLOCK	TIMER	UNLOCK	GND	5V	Xtal	Xtal	GND	VCV	GND	
0/0	-	0/0	0/0	0/0	4.6/4.6	0/0	0/0	5.0/5.0	-	-	0/0	-	0/0	RX/TX



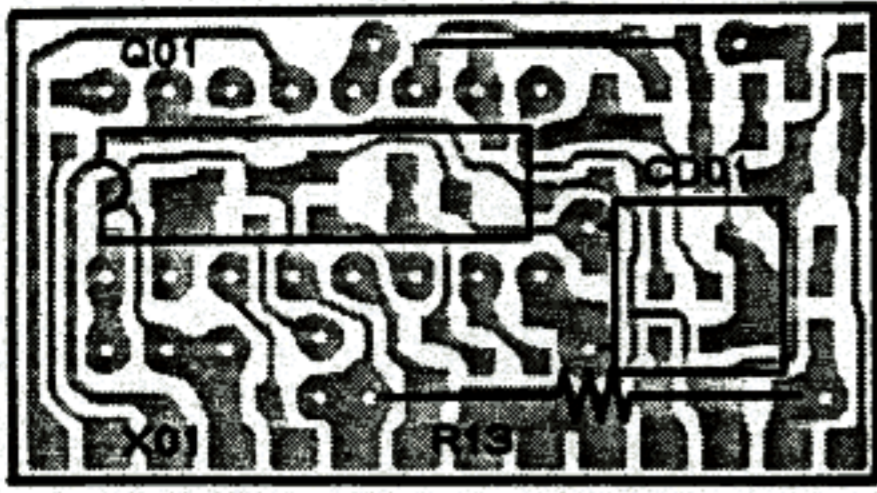
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Downloaded by Amateur Radio Directory

1 : 1/64, 1/65 VHF  
2 : 1/128, 1/129 UHF

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

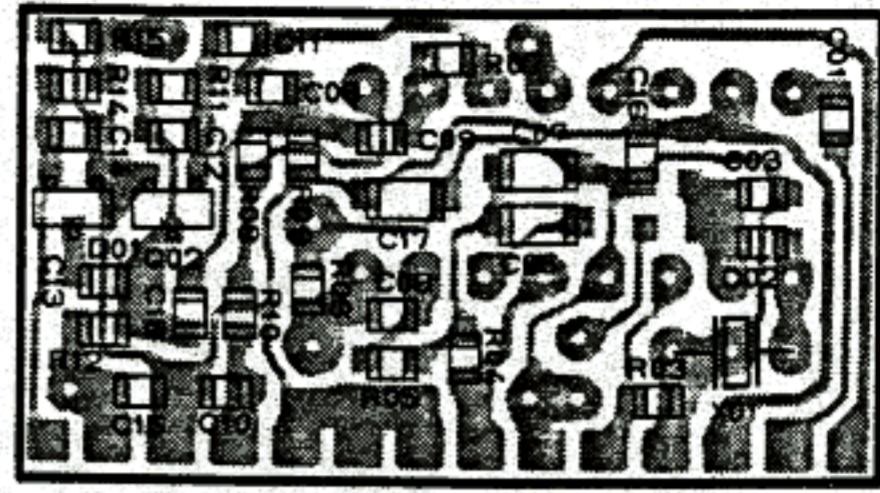


# IF UNIT



⑭ ⑬ ⑫ ⑪ ⑩ ⑨ ⑧ ⑦ ⑥ ⑤ ④ ③ ② ①

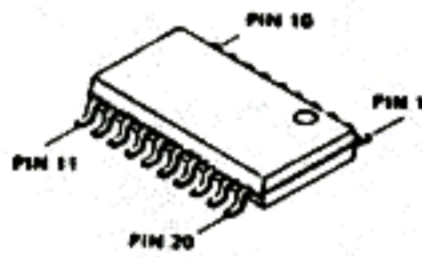
"component" side



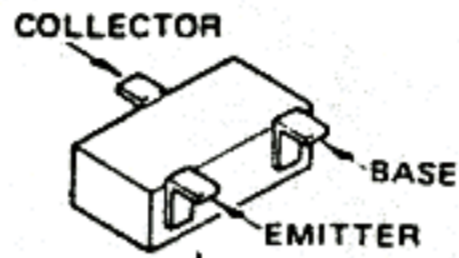
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

"chip-only" side

Schematheek  
Beh. T. Hultermans  
Postbus 4228  
5604 EE Eindhoven

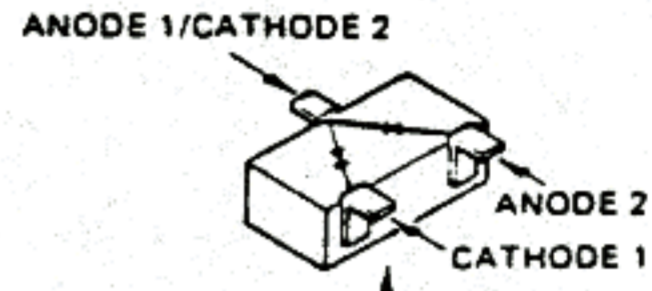


TK10420M (Q501)



Marked Surface

2SC1623 (L6/L7) (Q502)



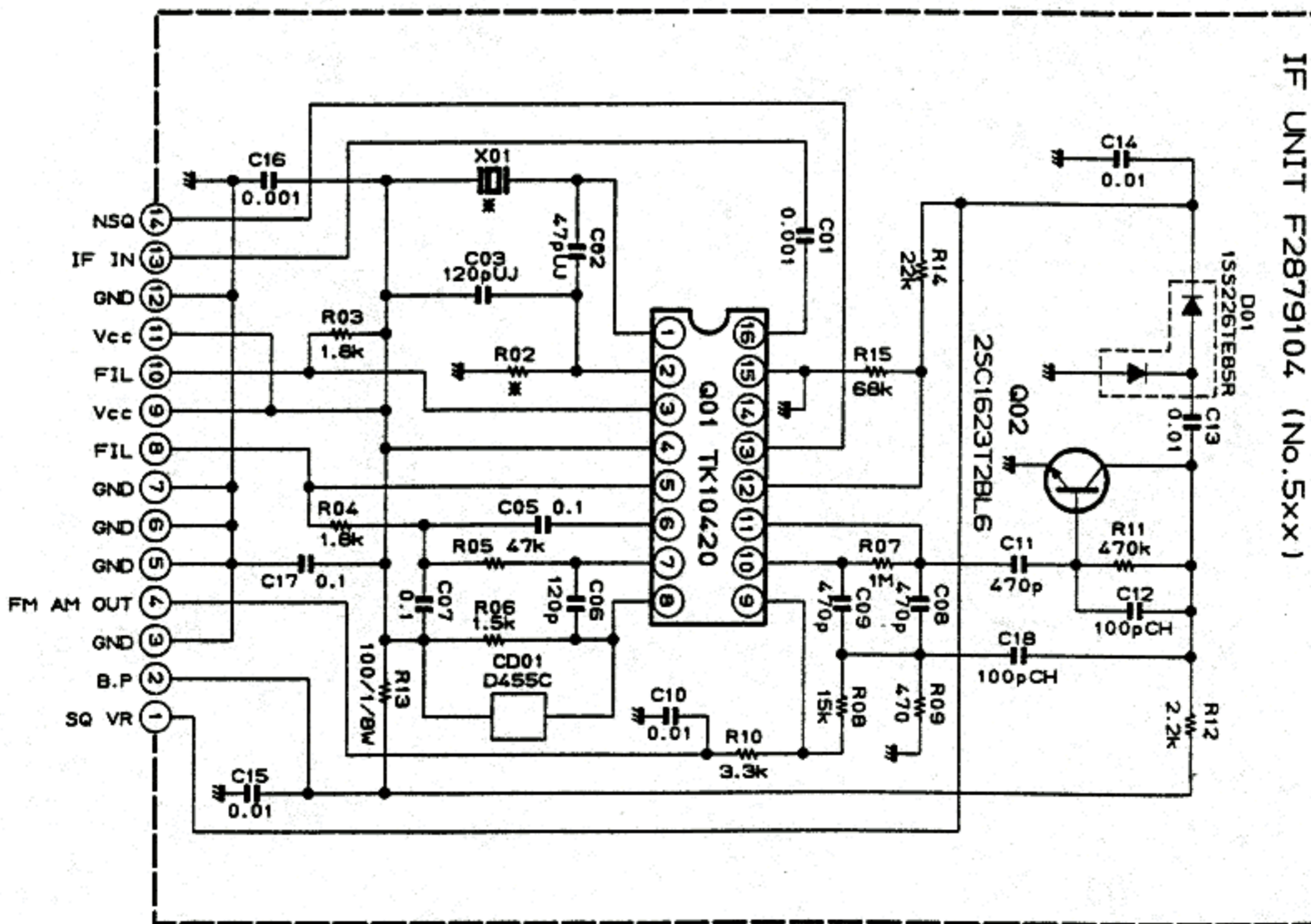
Marked Surface

1SS226 (C3) (D501)

## IF UNIT VOLTAGE CHART

(DC VOLTS)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	REMARKS
SQ VR	BYPASS	GND	FM AM OUT	GND	GND	GND	FIL	Vcc	FIL	Vcc	GND	IF IN	NSQ	
SG OFF 04-2270-72	8.2/0	0/0	—	0/0	0/0	0/0	—	8.4/0	8/0	8.4/0	0/0	0/0	50 ON/50 OFF 0/0 8.2/0	RX/TX

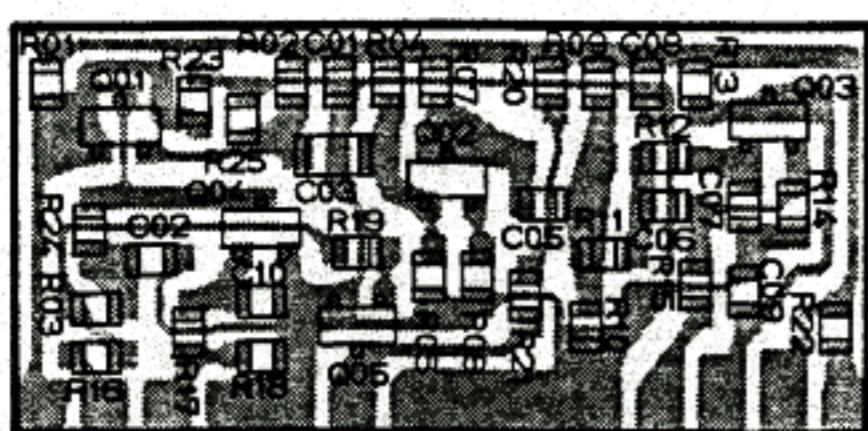


*	
X01	R02
FT-211	10.245MHz

RESISTOR VALUES ARE IN Ω, 1/10W  
CAPACITOR VALUES ARE IN μF:

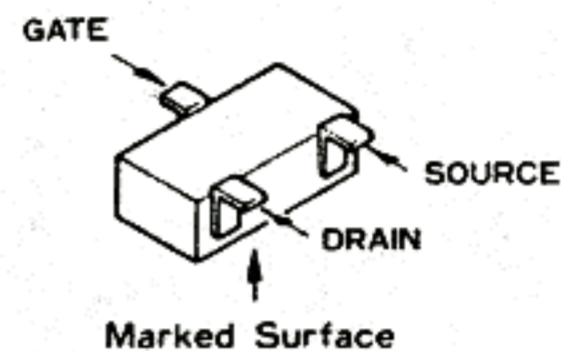


# AF UNIT

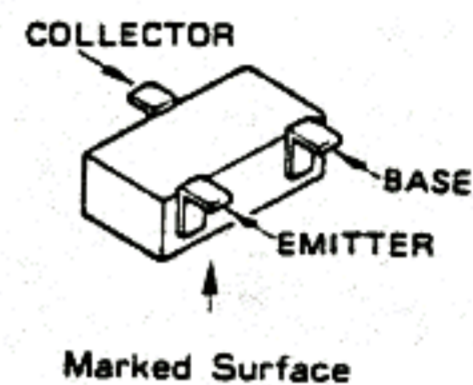


① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

"chip-only" side



2SK208Y (JY) (Q601)

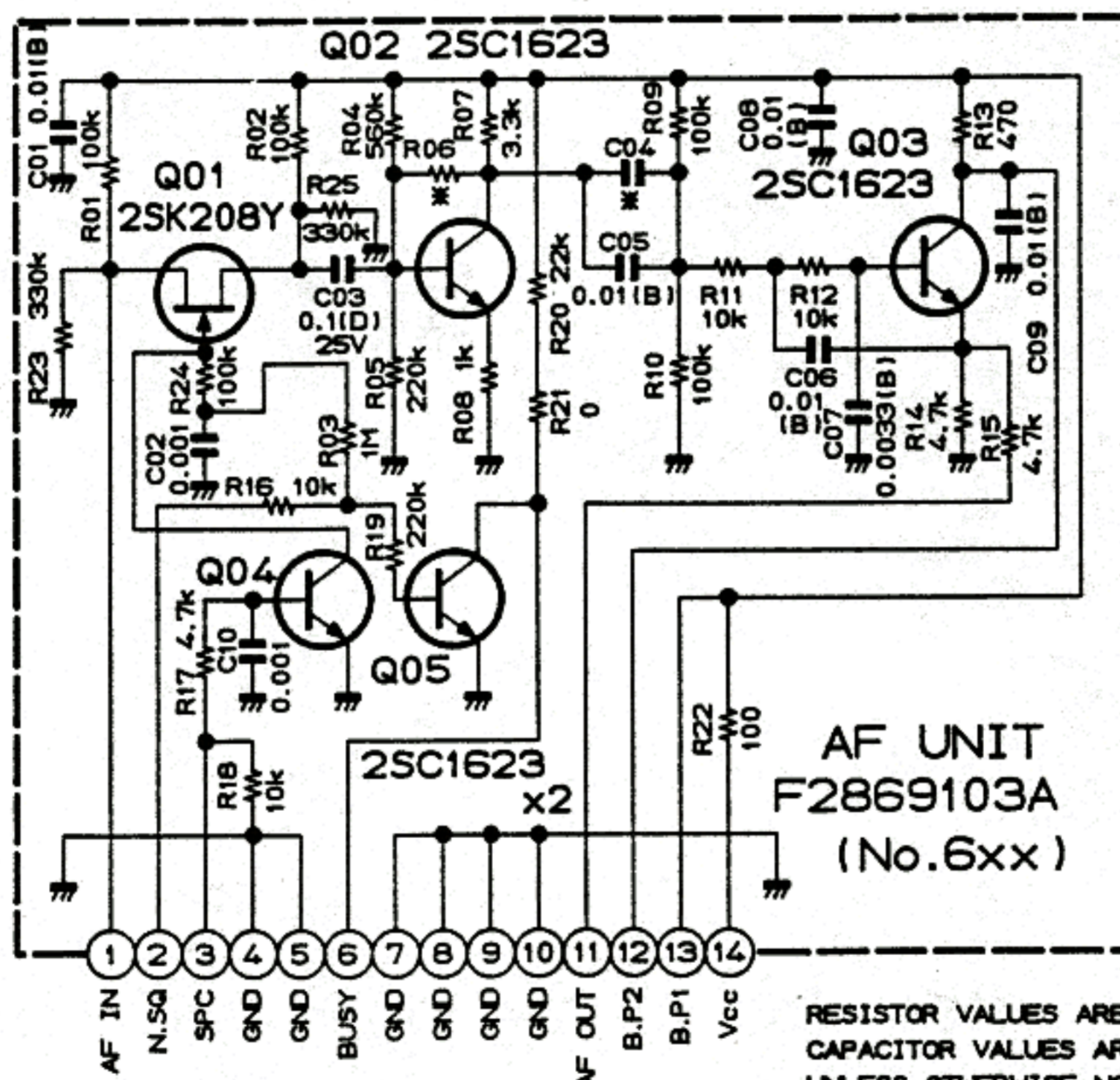


2SC1623 (L6/L7) (Q602,603,604,605)

## AF UNIT VOLTAGE CHART

(DC VOLTS)

1	2	3	4	5	6	7	REMARKS
AF IN	NSQ	SPC	GND	GND	BUSY	GND	
—	SO ON OFF 0/0 8.2/0	SO ON OFF 1/- 0/-	0/0	0/0	—	0/0	RX/TX
8	9	10	11	12	13	14	REMARKS
GND	GND	GND	AF OUT	BYPASS 2	BYPASS 1	Vcc	
0/0	0/0	0/0	—	7.6/7.6	8/8	8.4/8.4	RX/TX

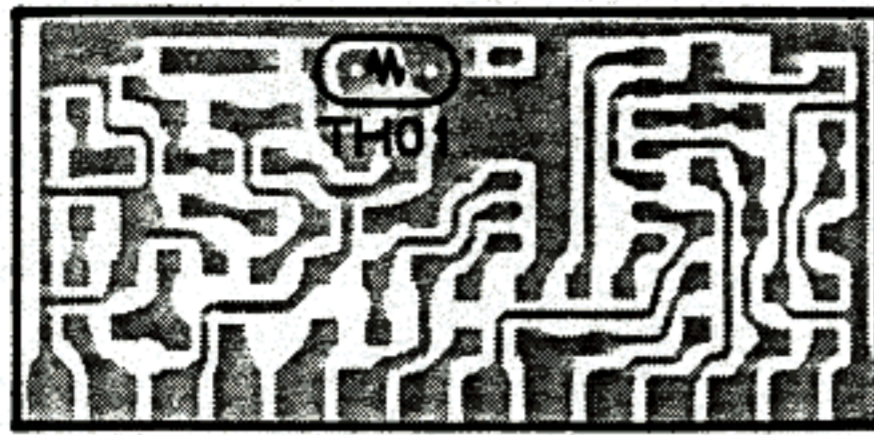


RESISTOR VALUES ARE IN Ω, 1/10W;  
CAPACITOR VALUES ARE IN μF, 50V;  
UNLESS OTHERWISE NOTED.  
\* R06 C04 : OUT OF USE

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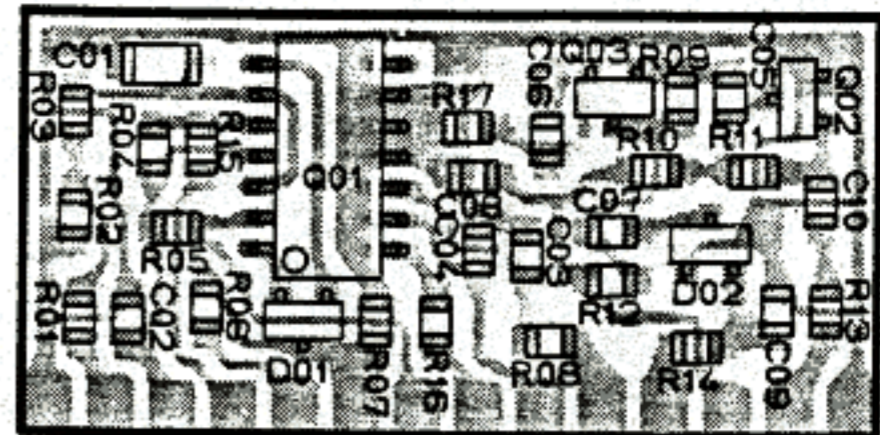


# METER UNIT



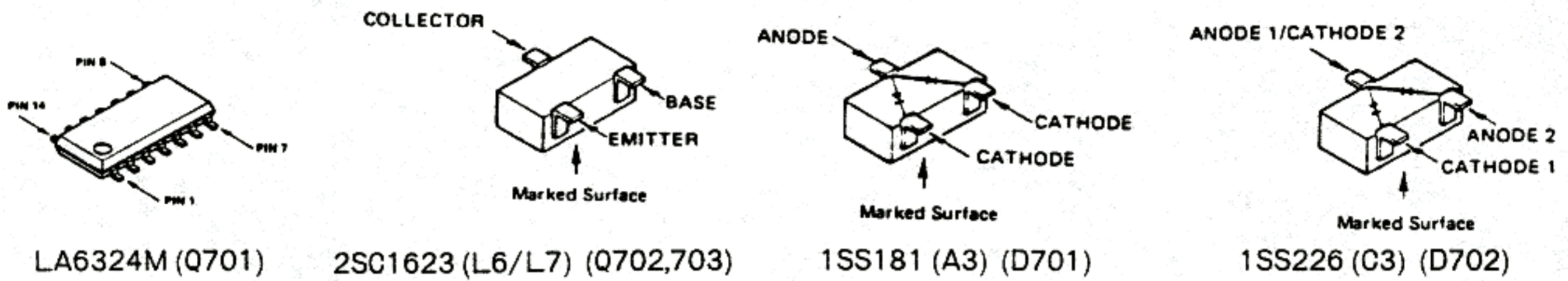
⑭ ⑬ ⑫ ⑪ ⑩ ⑨ ⑧ ⑦ ⑥ ⑤ ④ ③ ② ①

"component" side



① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

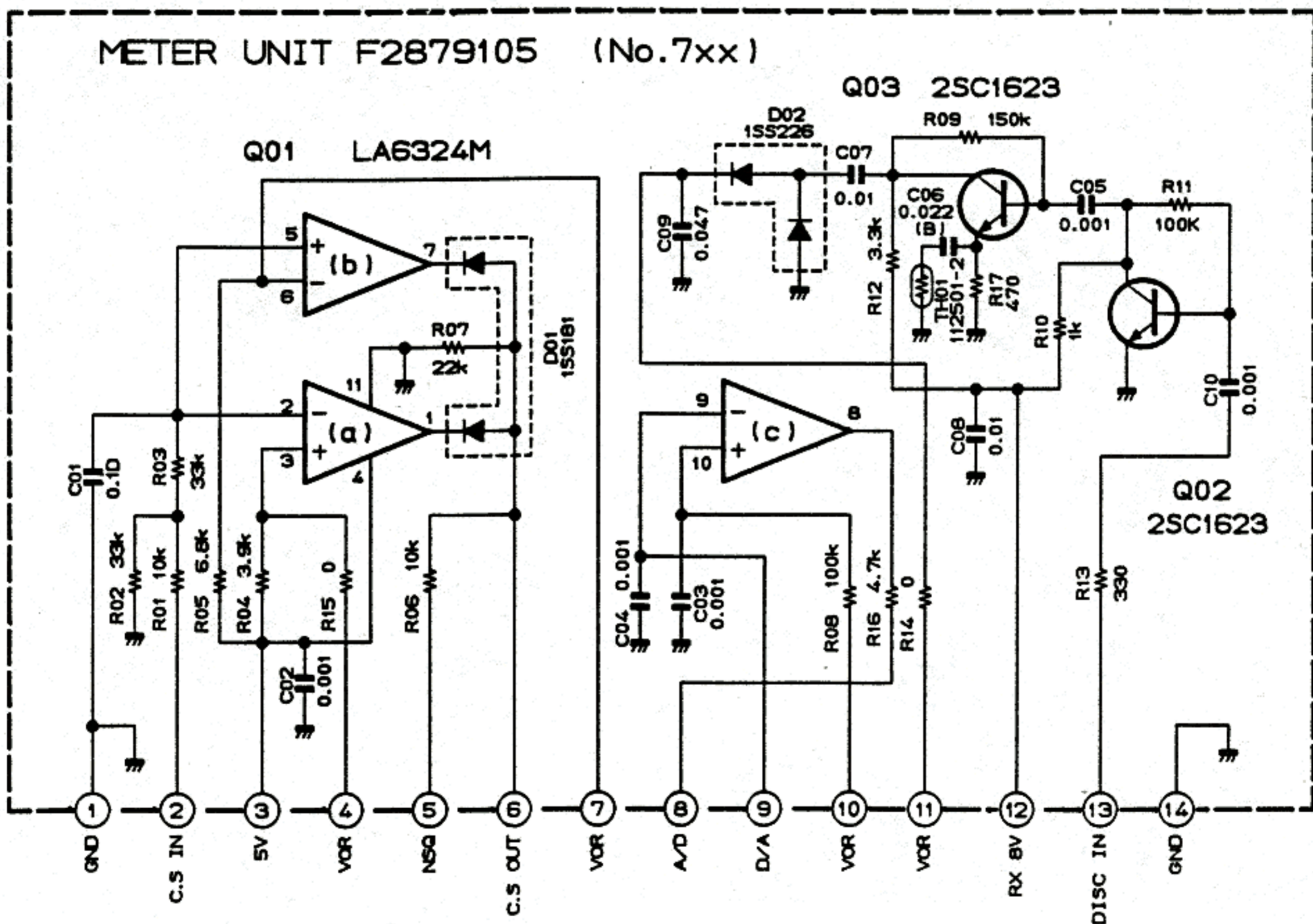
"chip-only" side



## METER UNIT VOLTAGE CHART

(DC VOLTS)

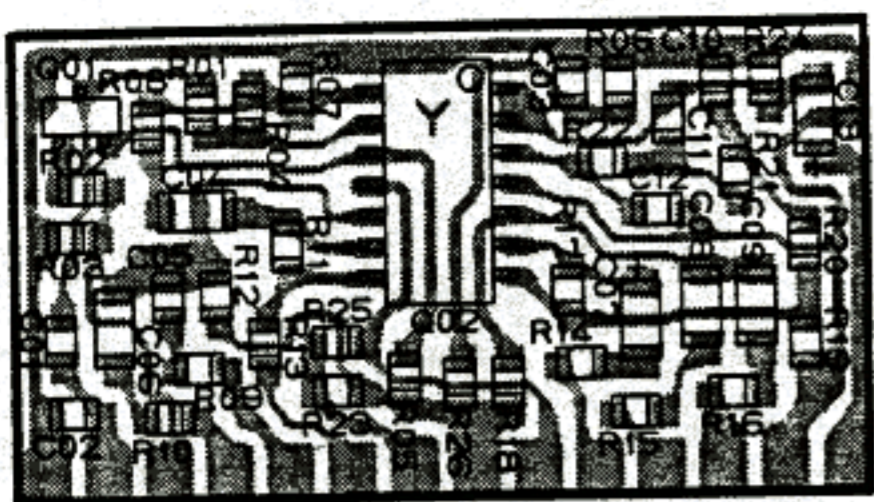
1	2	3	4	5	6	7	8	9	10	11	12	13	14	REMARKS
GND	C.S IN	5V	VOR	NSQ	C.S OUT	VOR	A/D	D/A	VOR	VOR	RX8V	DISC IN	GND	
SO ONLY OFF 0/0 0/0	SO ONLY OFF -/0 -/0	SO ONLY OFF 5/5 5/5	35-0/35-0	SO ONLY OFF 0/0 7.8/0	SO ONLY OFF 0/0 4.7/0	2.8-0/2.8-0	-	-	-	-	7.8/0	-	0/0	RX/TX



RESISTOR VALUES ARE IN  $\Omega$ , 1/10W;  
CAPACITOR VALUES ARE IN  $\mu$ F, 50V;  
UNLESS OTHERWISE NOTED.

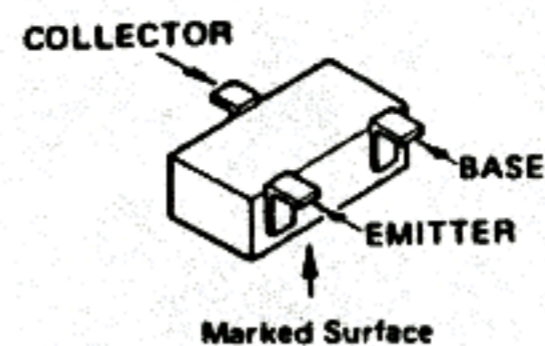


# MIC AMP UNIT



① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

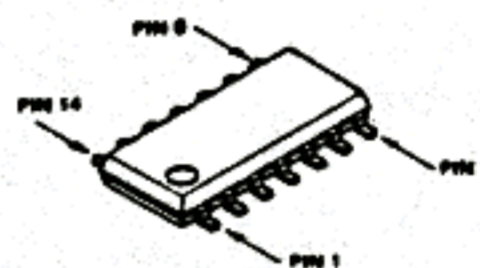
"chip-only" side



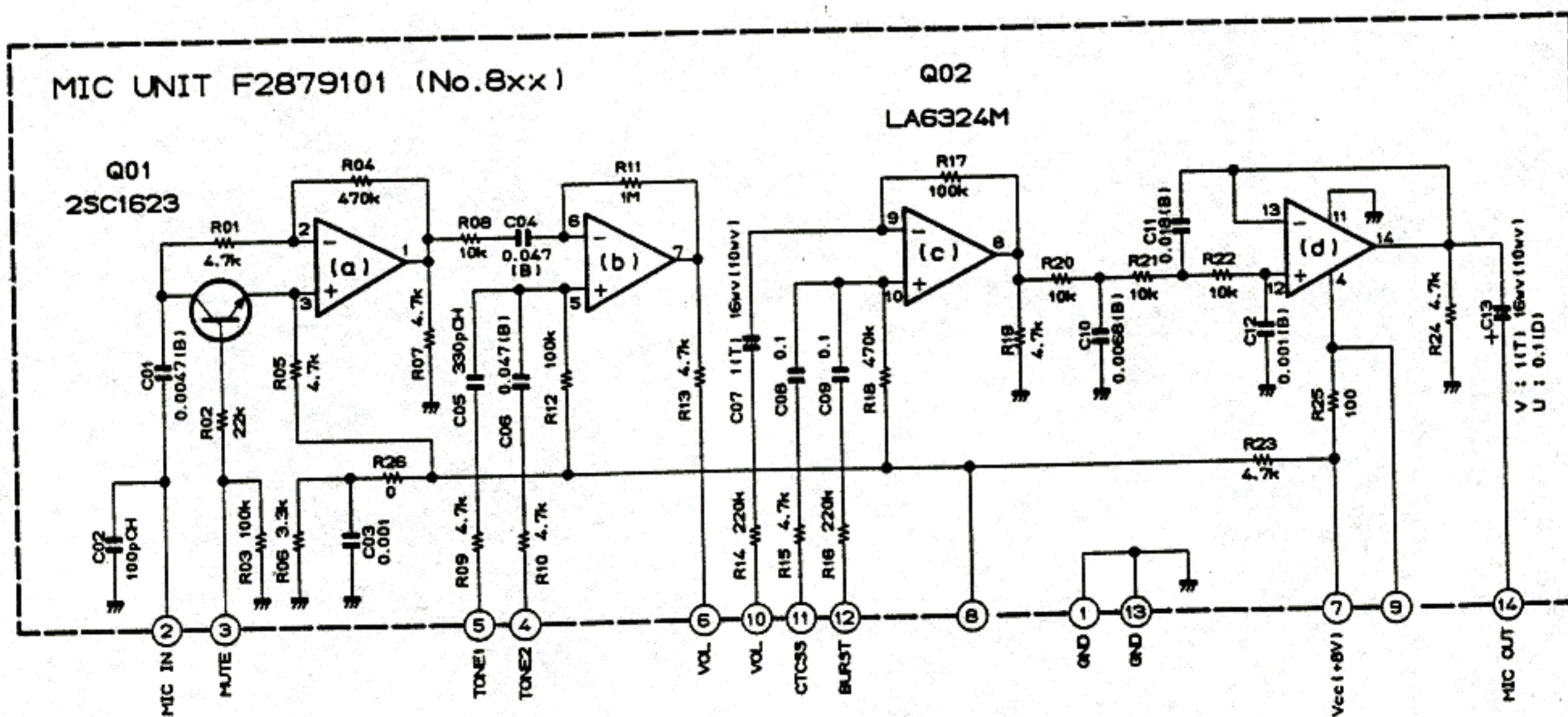
2SC1623 (L6/L7) (Q801)

## MIC AMP UNIT VOLTAGE CHART (DC VOLTS)

1	2	3	4	5	6	7	REMARKS
GND	MIC IN	MUTE	TONE 2	TONE 1	VOL	Vcc	RX/TX
0/0	0/0	7.9/0	0/0	0/0	3.7/3.4	8.4/8.4	
8	9	10	11	12	13	14	REMARKS
BYPASS 1	BYPASS 2	VOL	CTCSS	BURST	GND	MIC OUT	RX/TX
3.7/3.4	8.0/8.0	1.0/1.0	0/0	0/0	0/0	4.5/4.5	



LA6324M (Q802)

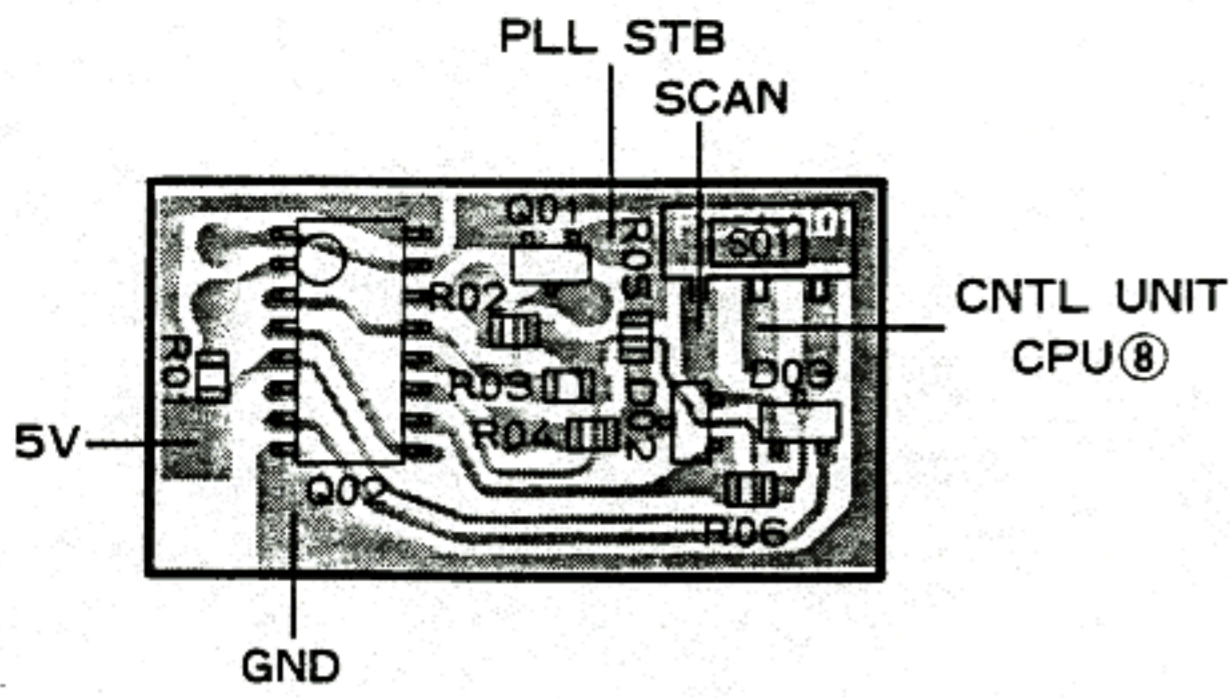


RESISTOR VALUES ARE IN  $\Omega$ . 1/10W;  
CAPACITOR VALUES ARE IN  $\mu$ F. 50vv;  
UNLESS OTHERWISE NOTED.  
(T) CAPACITORS ARE TANTALUM.

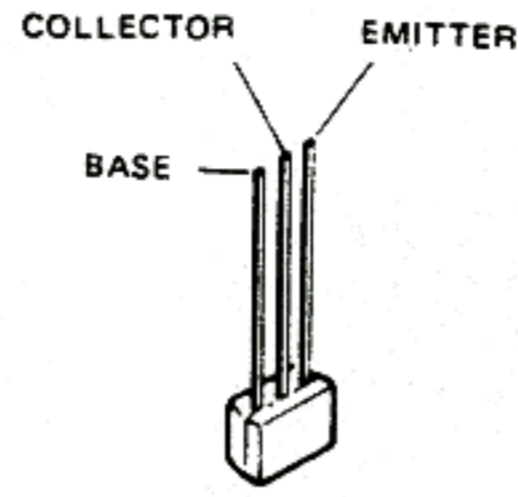
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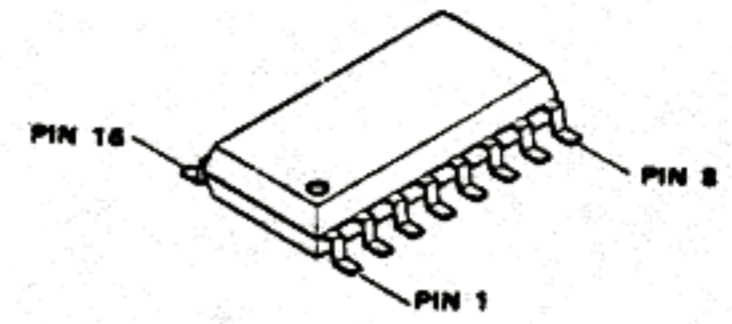
# SCAN UNIT



"chip-only" side



FA1A4M-T2B (Q901)

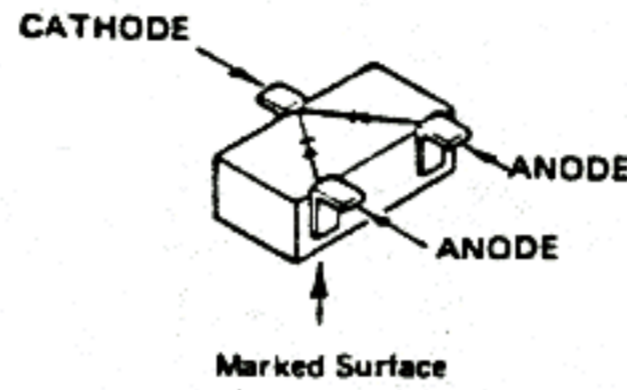


μPD4538BG (Q902)

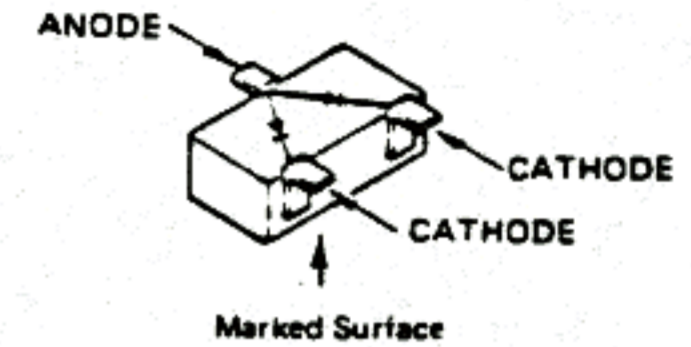
## SCAN UNIT VOLTAGE CHART

(DC VOLTS)

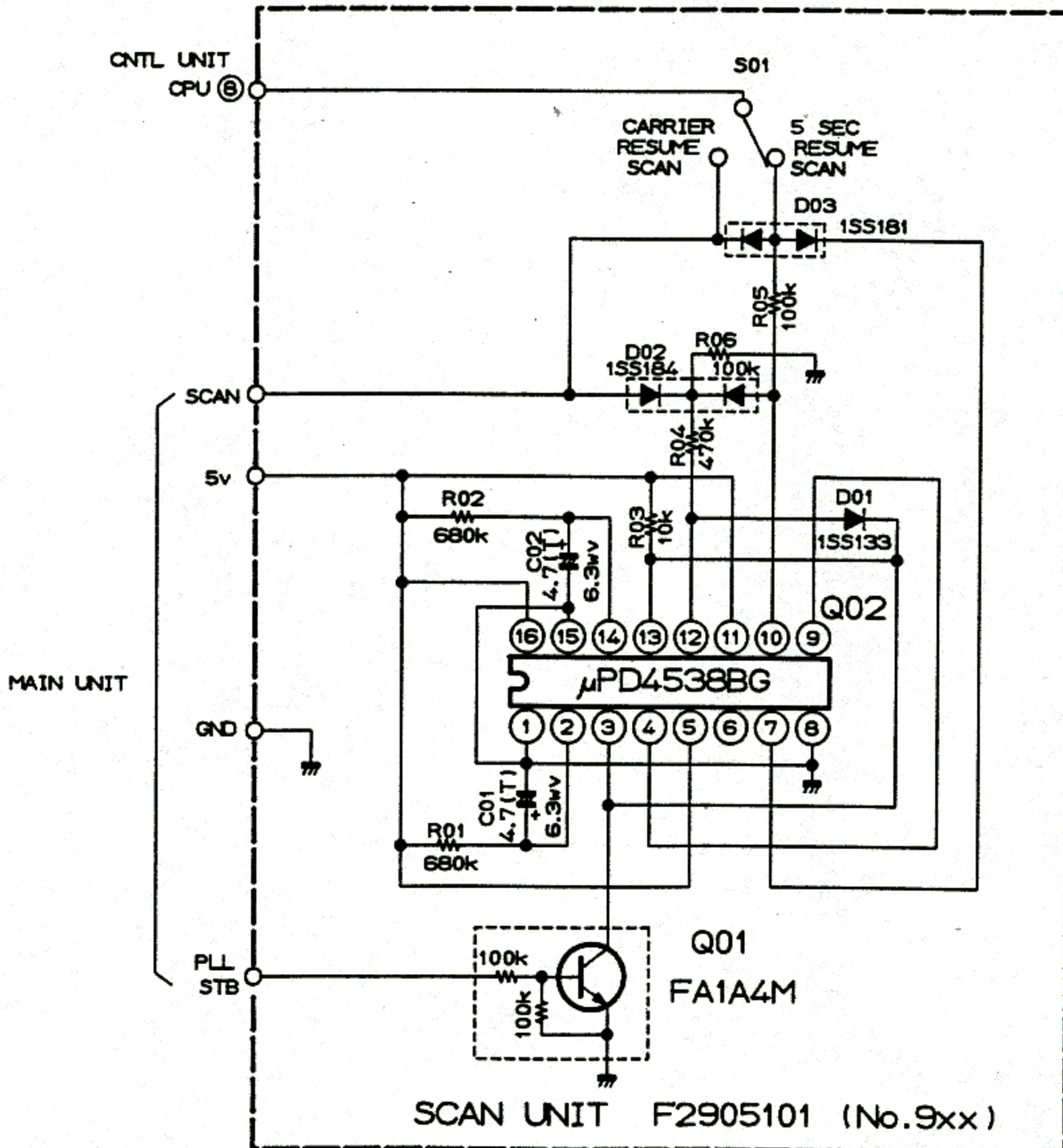
CPU 8	SCAN	5V	PLL STB	REMARKS
50 ON/50 OFF 5 0 0 0	50 ON/50 OFF 5/0 0/0	50 ON/50 OFF 5/5 5/5	-	RX/TX



1SS184 (B3) (D901)

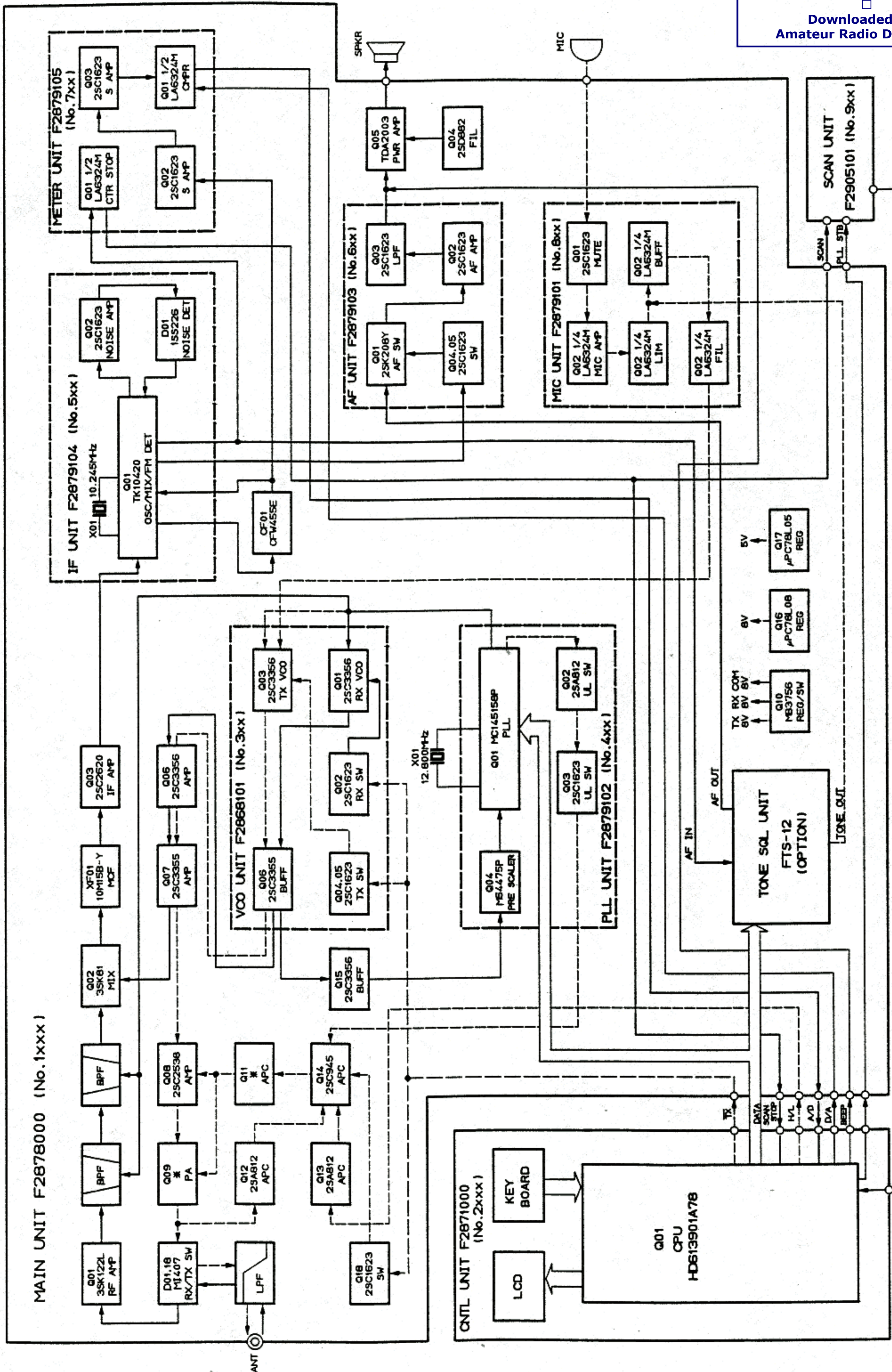


1SS181 (A3) (D903)



(T) CAPACITORS ARE TANTALUM.



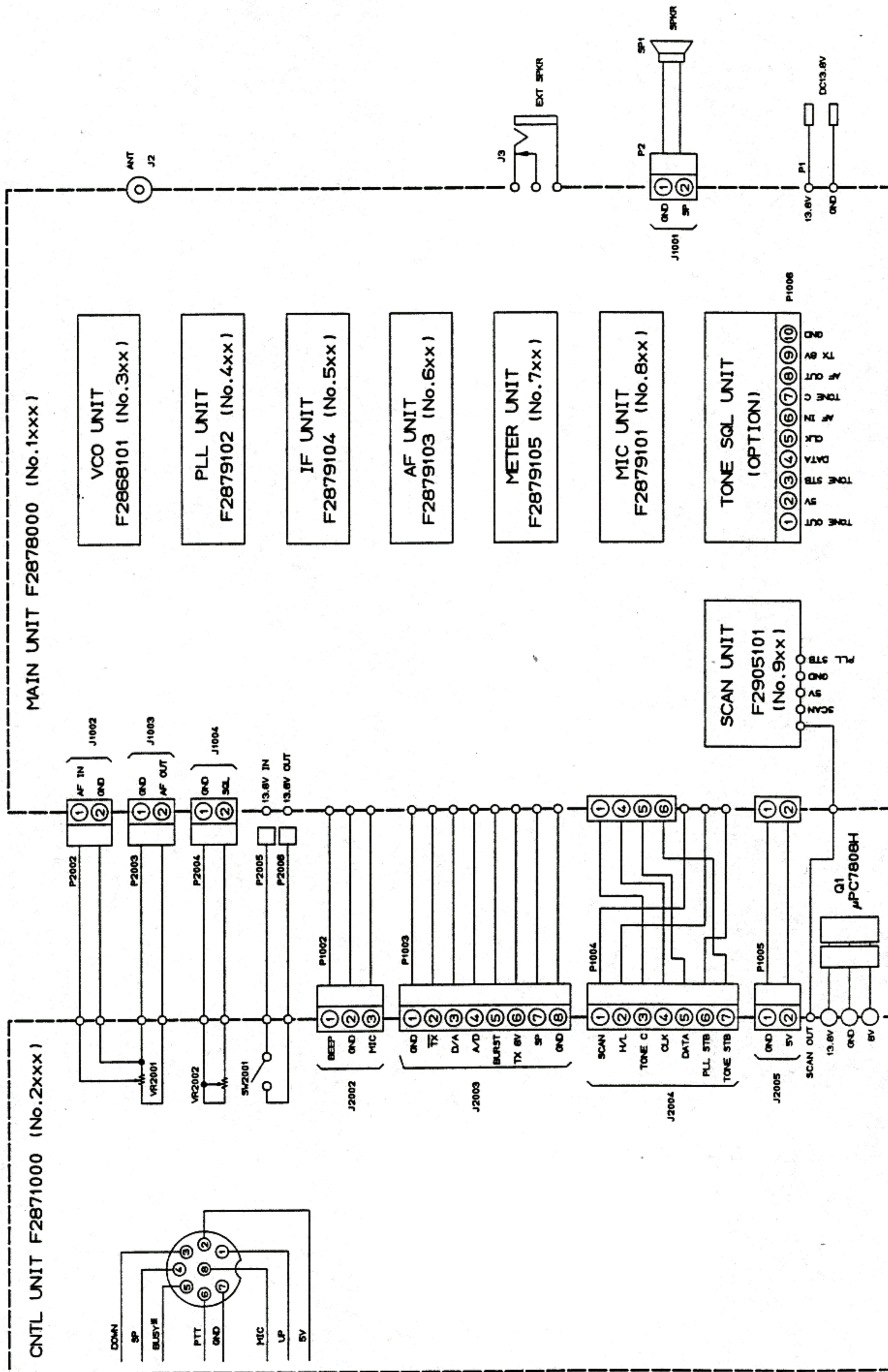


FT-211 Series  
 BLOCK DIAGRAM

TX LINE  
 RX LINE  
 COMMON LINE

Q09	Q11
FT-211RH	M67726 258942





FT-211RH  
CONNECTION DIAGRAM

\* ( BUSY A1,A2  
BURST PTT B,C,D,E

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## MAINTENANCE AND ALIGNMENT

The high reliability of the chip components in the FT-211RH minimize the possibility that repair or realignment should be needed after leaving the factory. However, if damage occurs and some parts subsequently be replaced, realignment may be required. If a sudden problem occurs during normal operation, it is likely due to component failure; realignment should not be done until after the faulty component has been replaced.

Because of the compact circuitry of this transceiver, we recommend that servicing be performed only by authorized Yaesu service technicians who are experienced with the circuitry and fully equipped for repair and alignment. Therefore, if a fault is suspected, contact the dealer from whom the transceiver was purchased for instructions regarding repair. Authorized Yaesu service technicians realign all circuits and make complete performance checks to ensure compliance with factory specifications after replacing any faulty components.

Those who do undertake any of the following alignments are cautioned to proceed at their own risk. Yaesu must reserve the right to change circuits and alignment procedures in the interest of improved performance, without notifying owners.

Under no circumstances should any alignment be attempted unless the normal function and operation of the transceiver are clearly understood, the cause of the malfunction has been clearly pinpointed and any faulty components replaced, and the need for realignment determined to be absolutely necessary.

The following test equipment (and thorough familiarity with its correct use) is necessary for complete realignment. Correction of problems caused by misalignment resulting from use of improper test equipment is not covered under the warranty policy.

A 50-ohm dummy load that is non-reactive up to 150 MHz is required. Correct alignment is not possible with an antenna.

### Alignment Equipment

DC voltmeter (at least 20-kilohms/volt)  
150 MHz standard signal generator (SSG) with calibrated level and modulation (see note below)  
AF signal generator  
SINAD meter (SINADDER)  
FM linear detector (deviation meter)  
CM coupler (directional coupler)  
RF wattmeter (50W,  $\pm 5\%$  @ 150MHz)  
50-ohm non-reactive (@150 MHz) dummy load  
Frequency counter (100Hz resolution at 150MHz)  
Oscilloscope (recommended, not required)

Note: SSG levels referred to in the alignment procedure are based on  $0\text{dBu}=0.5\mu\text{V}$ .

### Alignment Precautions

Correct alignment requires that the ambient temperature be the same as that of the transceiver and test equipment, and that this temperature be held constant between 20 and 30 °C (68 to 86 °F). When the transceiver is brought into the shop it should be allowed at least 2 hours for thermal equalization before alignment.

Alignments must not be made unless the oscillator shields and circuit boards are firmly affixed in place. Also, the frequency counter must be thoroughly warmed up before beginning.

Supply voltage during alignment must be held constant at 12.5V DC. Use a well regulated, adjustable power supply capable of at least 10A continuous load.



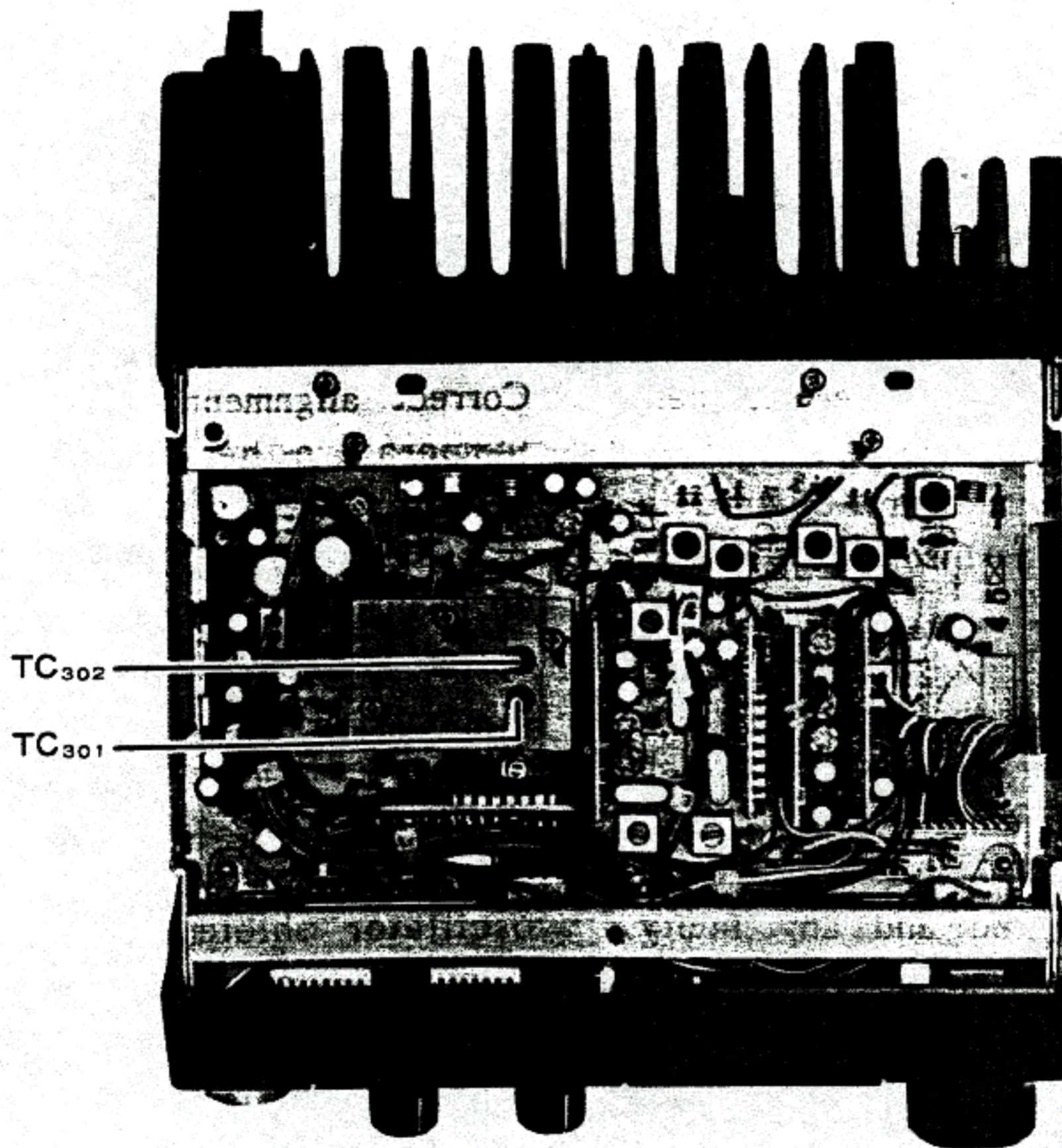
## A. PLL Unit

### 1) VCV (Varactor Control Voltage)

- a) With the dummy load connected to the ANT jack, connect the DC voltmeter (3V scale) to the VCV terminal on the VCO Unit.
- b) Tune the transceiver to the top edge of the band for the model being aligned, and while receiving, adjust TC301 on the VCO Unit for the voltage indicated below ( $\pm 0.1V$ ) for Receive at that frequency:

	Receive	Transmit
146 MHz	1.7V	1.4V
148 MHz	1.9V	1.6V

- c) Retune the transceiver to 144 MHz and confirm at least 1.5V.
- d) Retune to the top edge of the band, close the PTT line, and adjust TC302 for the voltage indicated above for Transmit.
- e) Again retune to 144 MHz and confirm at least 1.2V on the meter while transmitting.
- f) Repeat steps b - e several times, and then remove the voltmeter.



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## B. Transmitter

Set up the test equipment as shown in Figure 1. Close the PTT line when making adjustments. All adjustment points are on the Main Unit.

### 1) Early Stage Coupling

- a) Tune the transceiver to the center of the band, and set the LOW button to the high power (undeepressed) position.
- b) Adjust TC1001 and TC1002 for maximum power output (at least 46 watts).

### 2) Power Output

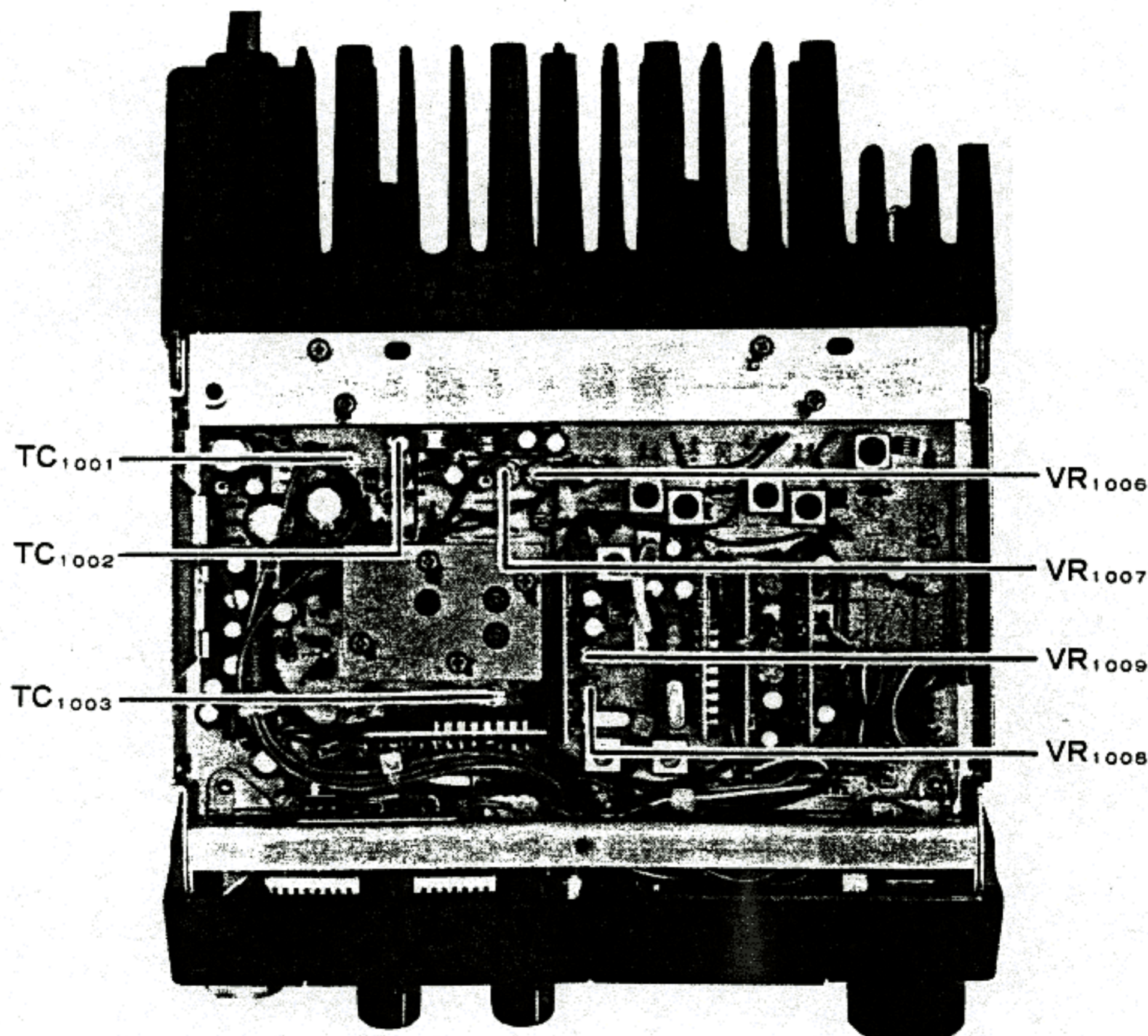
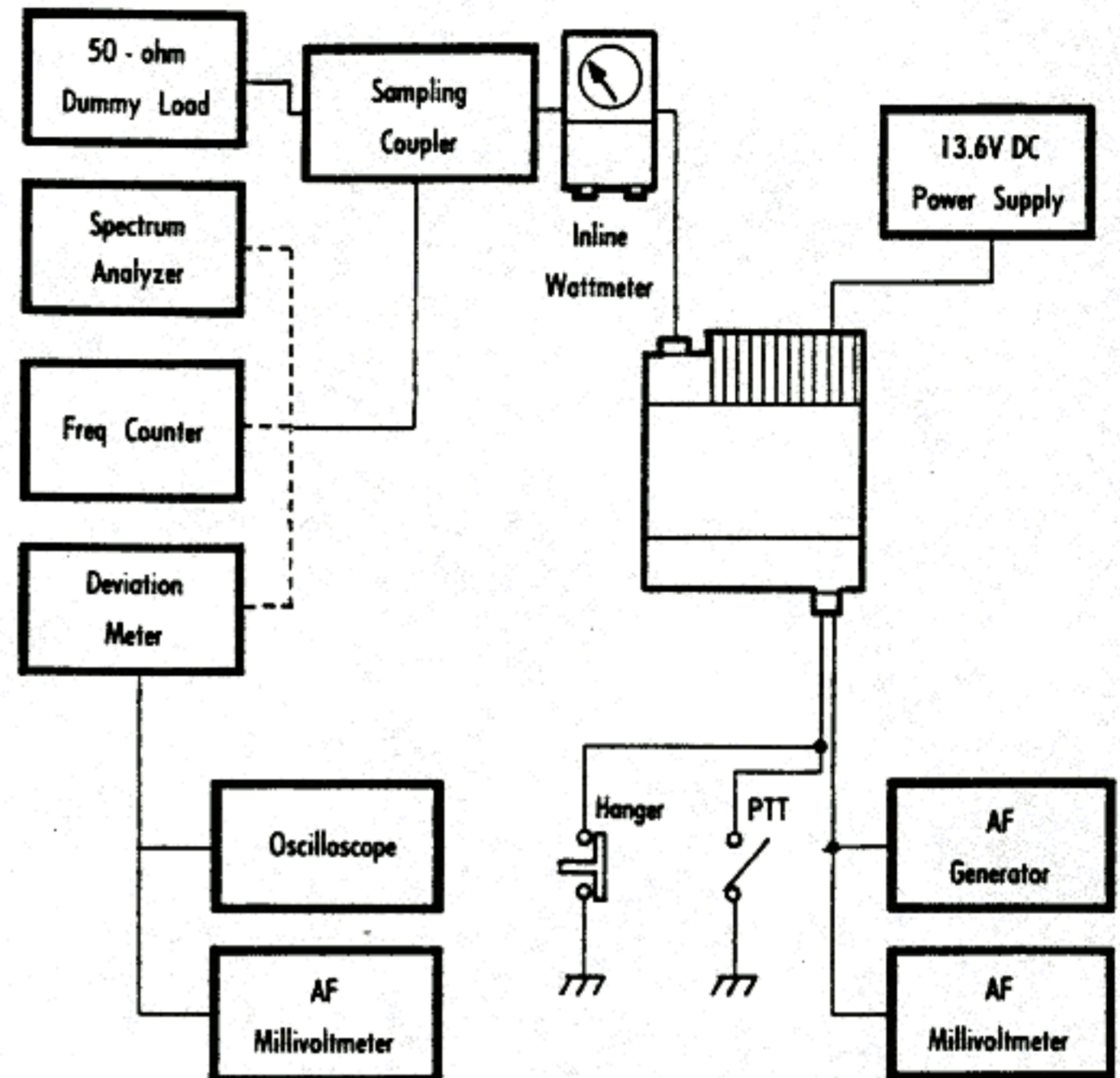
- a) While tuned to the center of the band, adjust VR1007 for 46 watts output with the LOW switch set for high power.
- b) Now press the LOW switch and adjust VR1006 for 5W output.

### 3) Frequency Calibration

- a) Adjust TC1003 to match the counter indication with the transceiver frequency.

### 4) Deviation

- a) Set the AF generator for 25mV output at 1 kHz. Adjust VR1009 for  $\pm 4.5$  kHz deviation on the Deviation Meter.
- b) Reduce the AF generator level to 2.5mV and adjust VR1008 for  $\pm 3.5$  kHz deviation.





## C. Receiver

Set up the test equipment as shown in Figure 2. All adjustment points are on the Main Unit.

### 1) Interstage Transformers

- a) Modulate the RF signal generator for  $\pm 3.5$  kHz deviation of a 1 kHz tone.
- b) Tune the transceiver and signal generator to the same frequency at the center of the band, and set the injection level to produce midrange S-meter indication.
- c) Adjust T1001 through T1008 for maximum S-meter indication. Reduce the injection level, if necessary, to keep the S-meter near midrange.
- d) Confirm 12dB SINAD sensitivity of -8dBu (0.2uV) or better on the SINADDER.

### 2) S-Meter Calibration

- a) At the center of the band, set the signal generator for 15dBu (2.8uV) injection with  $\pm 3$  kHz deviation of a 1 kHz tone.

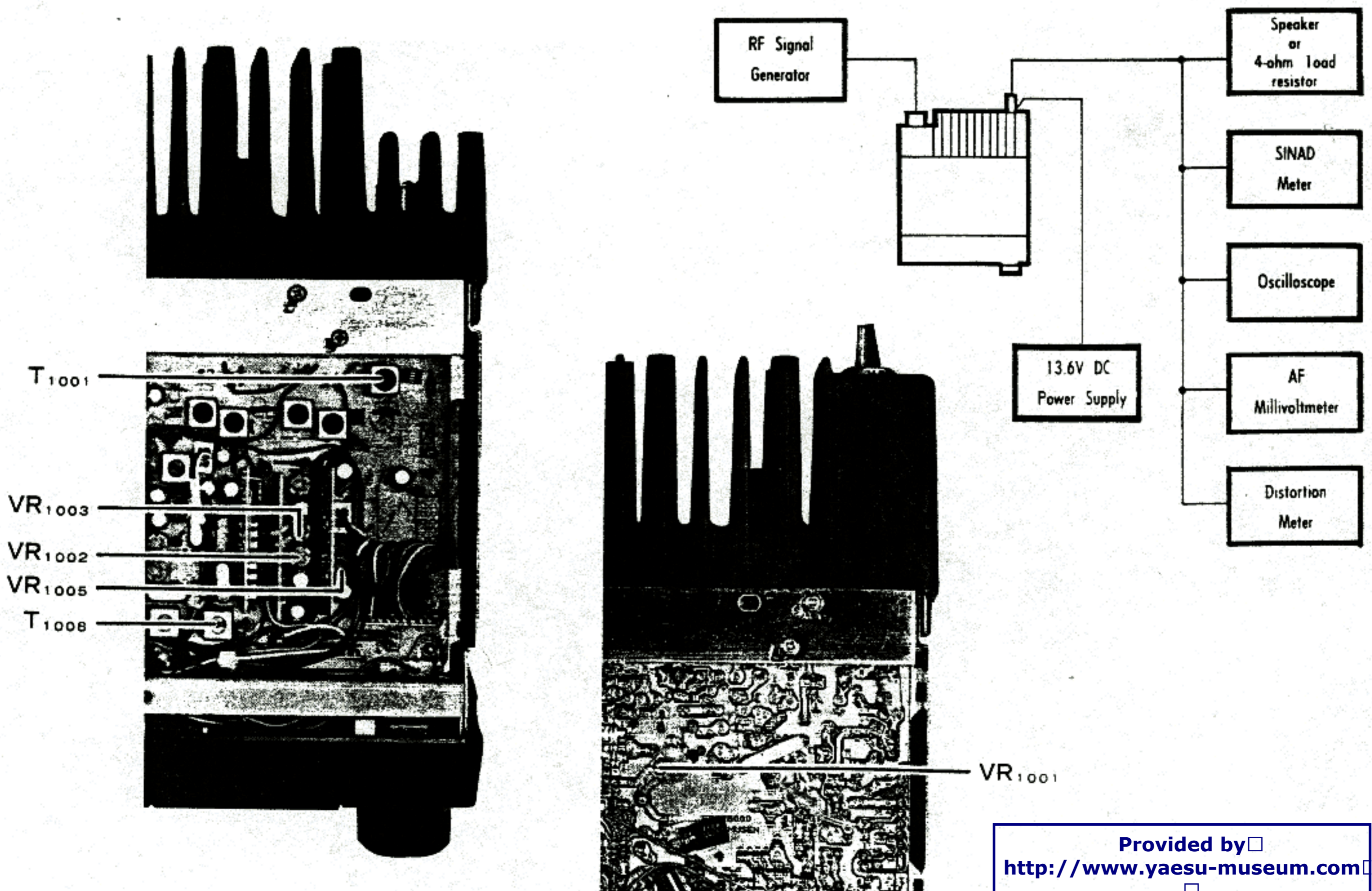
- b) Adjust VR1001 so that all S-meter segments are just on.
- c) Reduce the injection to -4dBu (0.3uV) and adjust T1008 so that the S-meter just begins to indicate.

### 3) Scanner Center-Stop

- a) Tune the transceiver to 145.000 MHz, and set the SQL fully counterclockwise (the BUSY lamp should be lit).
- b) Tune the signal generator to 145.0035 MHz, and inject 20dBu (5uV) with  $\pm 3$  kHz deviation of a 1 kHz tone.
- c) Adjust VR1003 so that the BUSY lamp just turns off.
- d) Now tune the signal generator to 144.9965 MHz and adjust VR1002 so that the BUSY lamp again just turns off.

### 4) Beeper Volume

- a) Adjust VR1005 as desired (this is normally set to maximum at the factory).



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# FT-211 PARTS LIST

MAIN CHASSIS			
Symbol No.	Part No.	Description	Device
J1	P0090158	Connector (MIC)	
J2	P1090556	Connector (ANT)	
J3	P1090544	Connector (EXT SP)	
SP1	M4090066	Speaker	VS-66Y
P1	T9204868B	TW-ASSY	
P2	T9205469B	CW-ASSY	
Q1	G1090294	IC	PC7808H
MAIN UNIT			
Symbol No.	Part No.	Description	Device
	F2878000	Printed Circuit Board	
	C028780BD	PCB With Components Version A1, A2, B, C, D, E**	
	C028780BA	PCB With Components Version F*	
	C028780BB	PCB With Components Version F**	
Q1001	G4801220L	FET	3SK122L
Q1002	G4800810	FET	3SK81
Q1003	G3326207B	Transistor	2SC2620QBTR
Q1004	G3408220	Transistor	2SD882
Q1005	G1090769	IC	TDA2003
Q1006	G3333567	Transistor	2SC3356-T2B
Q1007	G3333550	Transistor	2SC3355
Q1008	G3325380	Transistor	2SC2538
Q1009	G1090251	IC*	M57715
	G1090625	IC**	M57726
Q1010	G1090222	IC	MB3756M
Q1011	G3211340R	Transistor*	2SB1134R
	G3209420	Transistor**	2SB942
Q1012	G3108127F	Transistor	2SA812-T2BM6B
Q1013	G3108127F	Transistor	2SA812-T2BM6B
Q1014	G3309451P	Transistor	2SC945AP
Q1015	G3333567	Transistor	2SC3356-T2B
Q1016	G1090080	IC	uPC78L08
Q1017	G1090084	IC	uPC78L05
Q1018	G3316237F	Transistor	2SC1623-T2BL6B
Q1019	G3090081	Transistor	BN1A4M
D1001	G2090345	Diode	MI407
D1002	G2090033	Diode	MI301
D1003	G2070003	Diode	1SS226TE85R
D1005	G2070046	Diode	1SV188-5TRC
D1006	G2070046	Diode	1SV188-5TRC
D1007	G2070046	Diode	1SV188-5TRC
D1008	G2070046	Diode	1SV188-5TRC
D1009	G2070046	Diode	1SV188-5TRC
D1010	G2070046	Diode	1SV188-5TRC
D1011	G2070046	Diode	1SV188-5TRC
D1012	G2070046	Diode	1SV188-5TRC
D1013	G2070003	Diode	1SS226TE85R
D1014	G2015550	Diode	1S1555
D1015	G2090344	Diode	1SV178
D1016	G2090344	Diode	1SV178
D1017	G2015550	Diode	1S1555
D1018	G2090345	Diode	MI407
D1019	G2090377	Diode	1SS108
D1020	G2090377	Diode	1SS108
D1021	G2090232	Diode	S11B
D1022	G2070009	Diode	1SS184TE85R
X1001	H0102801	XTAL	HC-49/T 12.8MHz
XF1001	H1102096	XTAL Filter	10M 15B-Y
CF1001	H3900200	Ceramic Filter	CFW455E
R1001	J24205333	RES Chip.	1/10W 33kΩ
R1002	J24205473	RES Chip.	1/10W 47kΩ
R1003	J24205473	RES Chip.	1/10W 47kΩ
R1004	J24205470	RES Chip.	1/10W 47Ω
R1005	J24205104	RES Chip.	1/10W 100kΩ
R1006	J24205104	RES Chip.	1/10W 100kΩ
R1007	J24205104	RES Chip.	1/10W 100kΩ
R1008	J24205104	RES Chip.	1/10W 100kΩ
R1009	J24205560	RES Chip.	1/10W 56Ω
R1010	J24205560	RES Chip.	1/10W 56Ω
R1011	J24205472	RES Chip.	1/10W 4.7kΩ
R1012	J24205101	RES Chip.	1/10W 100Ω
R1013	J24205151	RES Chip.	1/10W 150Ω
R1014	J01245390	Carbon Film RES.	1/4W 39Ω
R1015	J24205151	RES Chip.	1/10W 150Ω
R1016	J24205102	RES Chip.	1/10W 1kΩ
R1017	J24205562	RES Chip.	1/10W 5.6kΩ
R1018	J24205223	RES Chip.	1/10W 22kΩ
R1019	J24205682	RES Chip.	1/10W 6.8kΩ
R1020	J24205471	RES Chip.	1/10W 470Ω
R1021	J24205560	RES Chip.	1/10W 56Ω
R1022	J02245101	Carbon Film RES.	1/4W 100Ω
R1023	J24205222	RES Chip.	1/10W 2.2kΩ
R1024	J02245273	Carbon Film RES.	1/4W 27kΩ
R1025	J24205471	RES Chip.	1/10W 470Ω
R1026	J02245229	Carbon Film RES.	1/4W 2.2Ω
R1027	J01275221	Carbon Film RES.	1/2W 220Ω
R1028	J02245010	Carbon Film RES.	1/4W 1Ω
R1029	J24205102	RES Chip.	1/10W 1kΩ
R1030	J24205560	RES Chip.	1/10W 56Ω
R1031	J24205180	RES Chip.	1/10W 18Ω
R1032	J24205180	RES Chip.	1/10W 18Ω
R1033	J24205180	RES Chip.	1/10W 18Ω
R1034	J24205680	RES Chip.	1/10W 68Ω
R1035	J24205680	RES Chip.	1/10W 68Ω
R1036	J02245103	Carbon Film RES.	1/4W 10kΩ
R1037	J24205332	RES Chip.	1/10W 3.3kΩ
R1038	J24205271	RES Chip.*	1/10W 270Ω
	J24205181	RES Chip.**	1/10W 180Ω
R1039	J24205560	RES Chip.	1/10W 56Ω
R1040	J02245222	Carbon Film RES.	1/4W 2.2kΩ
R1041	J24205102	RES Chip.	1/10W 1kΩ
R1042	J24205102	RES Chip.	1/10W 1kΩ
R1043	J24205222	RES Chip.	1/10W 2.2kΩ
R1044	J01275100	Carbon Film RES.	1/4W 10Ω
R1045	J02245101	Carbon Film RES.	1/4W 100Ω
R1046	J01275151	Carbon Film RES.	1/4W 150Ω
R1047	J24205102	RES Chip.	1/10W 1kΩ
R1048	J24205332	RES Chip.	1/10W 3.3kΩ
R1049	J24205471	RES Chip.	1/10W 470Ω
R1050	J24205472	RES Chip.	1/10W 4.7kΩ
R1051	J24205103	RES Chip.	1/10W 10kΩ
R1052	J24205680	RES Chip.	1/10W 68Ω
R1053	J24205222	RES Chip.	1/10W 2.2kΩ
R1054	J24205102	RES Chip.	1/10W 1kΩ
R1055	J02245100	Carbon Film RES.	1/4W 10Ω
R1056	J24205103	RES Chip.	1/10W 10kΩ
R1057	J24205332	RES Chip.	1/10W 3.3kΩ
R1058	J01225225	Carbon Film RES.	1/6W 2.2MΩ
R1059	J24205222	RES Chip.	1/10W 2.2kΩ
R1060	J24205102	RES Chip.	1/10W 1kΩ
R1061	J24205101	RES Chip.	1/10W 100Ω
R1062	J24205472	RES Chip.	1/10W 4.7kΩ
R1064	J02245221	Carbon Film RES.	1/4W 220Ω
R1065	J24205000	RES Chip.	1/10W 0Ω
R1066	J24205222	RES Chip.	1/10W 2.2kΩ
R1067	J01245223	Carbon Film RES.	1/4W 22kΩ
R1068	J24205000	RES Chip.	1/10W 0Ω
R1069	J24205100	RES Chip.	1/10W 10Ω
R1070	J24205000	RES Chip.	1/10W 0Ω
R1071	J24205000	RES Chip.	1/10W 0Ω
R1072	J02245562	Carbon Film RES.	1/4W 5.6kΩ
R1073	J24205000	RES Chip.	1/10W 0Ω
R1075	J24205000	RES Chip.	1/10W 0Ω
R1076	J24205000	RES Chip.	1/10W 0Ω
R1077	J24205000	RES Chip.	1/10W 0Ω
R1078	J24205000	RES Chip.	1/10W 0Ω
R1079	J24205000	RES Chip.	1/10W 0Ω
R1080	J24205000	RES Chip.	1/10W 0Ω
R1081	J24205473	RES Chip.	1/10W 47kΩ
R1082	J24205472	RES Chip.	1/10W 4.7kΩ
R1083	J24205100	RES Chip.	1/10W 10Ω
R1084	J24205472	RES Chip.	1/10W 4.7kΩ
R1085	J24205102	RES Chip.	1/10W 1kΩ
R1086	J01245473	Carbon Film RES.	1/4W 47kΩ
R1087	J24205000	RES Chip.	1/10W 0Ω

\* RF output 10W Model  
 \*\* RF output 45W Model



VR1001	J51745104	POT.	B	100k $\Omega$	C1071	K40129054	AL. Electro CAP.	16WV	47 $\mu$ F
VR1002	J51745103	POT.	B	10k $\Omega$	C1072	K40129004	AL. Electro CAP.	16WV	10 $\mu$ F
VR1003	J51745103	POT.	B	10k $\Omega$	C1073	K40109001	AL. Electro CAP.	10WV	100 $\mu$ F
VR1005	J51745104	POT.	B	100k $\Omega$	C1074	K40109001	AL. Electro CAP.	10WV	100 $\mu$ F
VR1006	J51745222	POT.	B	2.2k $\Omega$	C1075	K40109001	AL. Electro CAP.	10WV	100 $\mu$ F
VR1007	J51745223	POT.	B	22k $\Omega$	C1076	K22141904	CAP Chip.	D	25WV 0.1 $\mu$ F
VR1008	J51745103	POT.	B	10k $\Omega$	C1077	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
VR1009	J51745103	POT.	B	10k $\Omega$	C1078	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
VR1010	J50750104	POT.		100k $\Omega$	C1079	K22170215	CAP Chip.	CH	50WV 15pF
TH1001	G9090010	Thermistor		112302-2	C1080	K02172030	Ceramic CAP.	CH	50WV 3pF
C1001	K22170221	CAP Chip.	CH	50WV 27pF	C1081	K22170221	CAP Chip.	CH	50WV 27pF
C1002	K22170211	CAP Chip.	CH	50WV 10pF	C1082	K02179001	Ceramic CAP.	CH	50WV 1pF
C1003	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	C1083	K22170213	CAP Chip.	CH	50WV 12pF
C1004	K26170105	Ceramic CAP.	CH	50WV 4pF	C1084	K22170221	CAP Chip.	CH	50WV 27pF
C1005	K22170213	CAP Chip.	CH	50WV 12pF	C1085	K22170204	CAP Chip.	CH	50WV 3pF
C1006	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	C1086	K22170217	CAP Chip.	CH	50WV 18pF
C1007	K22170817	CAP Chip.	B	50WV 0.001 $\mu$ F	C1087	K10176102	Ceramic CAP.	B	50WV 0.001 $\mu$ F
C1008	K22170817	CAP Chip.	B	50WV 0.001 $\mu$ F	C1088	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1009	K22170201	CAP Chip.	CH	50WV 0.5pF	C1089	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1010	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	C1090	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1011	K26170107	Ceramic CAP.	CH	50WV 6pF	C1091	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1012	K22170201	CAP Chip.	CH	50WV 0.5pF	C1092	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1013	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1093	K40129016	AL. Electro CAP.	16WV	22 $\mu$ F
C1014	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	C1094	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1015	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1095	K22170235	CAP Chip.	CH	50WV 100pF
C1016	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1096	K22170805	CAP Chip.	CH	50WV 0.001 $\mu$ F
C1017	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1097	K22170805	CAP Chip.	CH	50WV 0.001 $\mu$ F
C1018	K22170206	CAP Chip.	CH	50WV 5pF	C1098	K22170817	CAP Chip.	CH	50WV 0.01 $\mu$ F
C1019	K26170609	Ceramic CAP.	B	50WV 470pF	C1099	K02173070	Ceramic CAP.*	CH	50WV 7pF
C1020	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F		K02175150	Ceramic CAP.**	CH	50WV 15pF
C1021	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	C1100	K40129050	AL. Electro CAP.	16WV	220 $\mu$ F
C1022	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1101	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1023	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1102	K70167474	Tantalum CAP.		35WV 0.47 $\mu$ F
C1024	K22141904	CAP Chip.	D	25WV 0.1 $\mu$ F	C1103	K22170217	CAP Chip.	CH	50WV 18pF
C1025	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1104	K22170217	CAP Chip.	CH	50WV 18pF
C1026	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1105	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1027	K40129004	AL. Electro CAP.		16WV 10 $\mu$ F	C1106	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1028	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1107	K22170215	CAP Chip.	CH	50WV 15pF
C1029	K40129004	AL. Electro CAP.		16WV 10 $\mu$ F	C1108	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1030	K40179001	AL. Electro CAP.		50WV 1 $\mu$ F	C1109	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1031	K70127475	Tantalum CAP.		16WV 4.7 $\mu$ F	C1110	K19149025	Ceramic CAP.		25WV 0.1 $\mu$ F
C1032	K40129004	AL. Electro CAP.		16WV 10 $\mu$ F	C1111	K19149017	Ceramic CAP.		25WV 0.022 $\mu$ F
C1033	K22141904	CAP Chip.	D	25WV 0.1 $\mu$ F	C1112	K70127685	Tantalum CAP.		16WV 6.8 $\mu$ F
C1034	K40179010	AL. Electro CAP.		50WV 0.47 $\mu$ F	C1113	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1035	K40129016	AL. Electro CAP.		16WV 22 $\mu$ F	C1114	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1036	K40129016	AL. Electro CAP.		16WV 22 $\mu$ F	C1115	K40129004	AL. Electro CAP.		16WV 10 $\mu$ F
C1037	K22141904	CAP Chip.	D	25WV 0.1 $\mu$ F	C1116	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1038	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	C1117	K40129004	AL. Electro CAP.		16WV 10 $\mu$ F
C1039	K40129046	AL. Electro CAP.		16WV 1000 $\mu$ F	C1118	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1040	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1119	K40109001	AL. Electro CAP.		10WV 100 $\mu$ F
C1041	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1120	K22170821	CAP Chip.	B	50WV 0.022 $\mu$ F
C1042	K40129042	AL. Electro CAP.		16WV 100 $\mu$ F	C1121	K40129016	AL. Electro CAP.		16WV 22 $\mu$ F
C1043	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1122	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1044	K40129046	AL. Electro CAP.		16WV 1000 $\mu$ F	C1123	K22170235	CAP Chip.	CH	50WV 100pF
C1045	K22141904	CAP Chip.	D	25WV 0.1 $\mu$ F	C1124	K22170235	CAP Chip.	CH	50WV 100pF
C1046	K40129054	AL. Electro CAP.		16WV 47 $\mu$ F	C1125	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1047	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1126	K40129004	AL. Electro CAP.		16WV 10 $\mu$ F
C1048	K40129042	AL. Electro CAP.		16WV 100 $\mu$ F	C1127	K22170235	CAP Chip.	CH	50WV 100pF
C1049	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1128	K22170235	CAP Chip.	CH	50WV 100pF
C1050	K40129054	AL. Electro CAP.		16WV 47 $\mu$ F	C1129	K22170235	CAP Chip.	CH	50WV 100pF
C1051	K40129042	AL. Electro CAP.		16WV 100 $\mu$ F	C1130	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1052	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1131	K40179011	AL. Electro CAP.		50WV 3.3 $\mu$ F
C1053	K40129042	AL. Electro CAP.		16WV 100 $\mu$ F	C1132	K40129054	AL. Electro CAP.		16WV 47 $\mu$ F
C1054	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1133	K40129016	AL. Electro CAP.		16WV 22 $\mu$ F
C1055	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1134	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F
C1056	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1135	K22141904	CAP Chip.	D	25WV 0.1 $\mu$ F
C1057	K22170211	CAP Chip.	CH	50WV 10pF	C1136	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F
C1058	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	C1137	K40129046	AL. Electro CAP.		16WV 1000 $\mu$ F
C1059	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	C1138	K22170217	CAP Chip.*	CH	50WV 18pF
C1060	K22170219	CAP Chip.	CH	50WV 22pF	C1139	K10179042	Ceramic CAP.*	B	50WV 0.001 $\mu$ F
C1061	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	C1140	K10176102	Ceramic CAP.	B	50WV 0.001 $\mu$ F
C1062	K22170217	CAP Chip.	CH	50WV 18pF	TC1001	K91000030	Trimmer CAP.		40pF
C1063	K22170219	CAP Chip.	CH	50WV 22pF	TC1002	K91000028	Trimmer CAP.**		10pF
C1064	K22170817	CAP Chip.	B	50WV 0.01 $\mu$ F	TC1003	K91000030	Trimmer CAP.		40pF
C1065	K22170219	CAP Chip.	CH	50WV 22pF	L1001	L0020679	Coil		
C1066	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	L1002	L0020679	Coil		
C1067	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	L1003	L1190254	M.RFC		4.7 $\mu$ H
C1068	K40129004	AL. Electro CAP.		16WV 10 $\mu$ F	L1004	L1190254	M.RFC		4.7 $\mu$ H
C1069	K22141904	CAP Chip.	D	25WV 0.1 $\mu$ F	L1005	L1190254	M.RFC		4.7 $\mu$ H
C1070	K22170805	CAP Chip.	B	50WV 0.001 $\mu$ F	L1006	L1190254	M.RFC		4.7 $\mu$ H

\* RF output 10W Model  
\*\* RF output 45W Model



L1007	L1020673	Coil		C303	K22170217	CAP Chip.	CH 50WV	18pF	
L1008	L1190254	M. RFC	4.7μH	C304	K22170805	CAP Chip.	B 50WV	0.001μF	
L1009	L0021705	Coil		C305	K22170203	CAP Chip.	CH 50WV	2pF	
L1010	L0020679	Coil		C306	K22170202	CAP Chip.	CH 50WV	1pF	
L1011	L0021359	Coil		C307	K22170211	CAP Chip.	CH 50WV	10pF	
L1012	L0020751	Coil		C308	K22170215	CAP Chip.	CH 50WV	15pF	
L1013	L0021359	Coil		C309	K22170217	CAP Chip.	CH 50WV	18pF	
L1014	L0020751	Coil		C310	K22170805	CAP Chip.	B 50WV	0.001μF	
L1015	L0021700	Coil		C311	K22170203	CAP Chip.	CH 50WV	2pF	
L1016	L0021700	Coil		C312	K22170817	CAP Chip.	B 50WV	0.01μF	
L1017	L1190250	M. RFC	2.2μH	C313	K22170209	CAP Chip.	CH 50WV	8pF	
L1018	L0021700	Coil		C314	K22170817	CAP Chip.	B 50WV	0.01μF	
L1019	L0020614	Coil		C315	K22170805	CAP Chip.	B 50WV	0.001μF	
L1020	L0020679	Coil		C316	K22170805	CAP Chip.	B 50WV	0.001μF	
L1021	L1020673	Coil		C317	K22170805	CAP Chip.	B 50WV	0.001μF	
L1022	L1190218	M. RFC	100μH	C318	K40109015	AL. Electro CAP.	10WV	100μF	
T1001	L0020345	Coil		TC301	K91000157	Trimmer CAP.		10pF	
T1002	L0021702	Coil		TC302	K91000157	Trimmer CAP.		10pF	
T1003	L0021703	Coil		L301	L0190135	Coil			
T1004	L0021703	Coil		L302	L0190136	Coil			
T1005	L0021704	Coil		L303	L1190246	M. RFC		1μH	
T1006	L0021164	Coil		L304	L1190246	M. RFC		1μH	
T1007	L0021164	Coil		L305	L1190246	M. RFC		1μH	
T1008	L0021164	Coil		L306	L1190254	M. RFC		4.7μH	
FB1001	L9190001	Ferrite Beads	4A2 RI3X3-1	L307	L1020672	Coil			
J1001	P0090524	Connector			R0119910	Shield Cover			
J1002	P0090524	Connector			R0119920	Shield Frame			
J1003	P0090524	Connector							
J1004	P0090524	Connector							
				PLL UNIT					
				Symbol No.	Part No.	Description	Device		
	T9205474	CW-ASSY			F2879102	Printed Circuit Board			
P1002	T9205469B	CW-ASSY			C028792AB	PCB With Component			
P1003	T9205470C	CW-ASSY							
P1004	T9205471B	CW-ASSY							
P1005	T9205472	CW-ASSY							
P1006	T9205473	CW-ASSY							
	L9190015	Shield Case	15mm	Q401	G1090648	IC		MC145158P	
	R0509420	Shield Plate		IF UNIT					
	R0509430	Shield Plate		Q402	G3108127F	Transistor		2SA812-T2BM6B	
				Q403	G3316237F	Transistor		2SC1623-T2BL6	
				Q404	G1090770	IC		M54475P	
VCO UNIT				R401	J01215100	Carbon Film RES.	1/8W	10Ω	
Symbol No.	Part No.	Description	Device	R402	J24205223	RES Chip.	1/10W	22kΩ	
	F2868101	Printed Circuit Board		R403	J24205223	RES Chip.	1/10W	22kΩ	
	C028681AA	PCB With Component		R404	J24205223	RES Chip.	1/10W	22kΩ	
	C028681AA	Component		R405	J24205223	RES Chip.	1/10W	22kΩ	
				R406	J24205103	RES Chip.	1/10W	10kΩ	
Q301	G3333567	Transistor	2SC3356-T2B	C401	K22170223	CAP Chip.	CH 50WV	33pF	
Q302	G3316237F	Transistor	2SC1623-T2BL6	C402	K22170221	CAP Chip.	CH 50WV	27pF	
Q303	G3333567	Transistor	2SC3356-T2B	C403	K22170805	CAP Chip.	B 50WV	0.001μF	
Q304	G3316237F	Transistor	2SC1623-T2BL6	C404	K22141904	CAP Chip.	D 25WV	0.1μF	
Q305	G3316237F	Transistor	2SC1623-T2BL6	C405	K22170817	CAP Chip.	B 50WV	0.01μF	
Q306	G3333550	Transistor	2SC3355	C406	K22170805	CAP Chip.	B 50WV	0.001μF	
				C407	K22170821	CAP Chip.	B 50WV	0.022μF	
D301	G2090271	Diode	1T33	C408	K22170805	CAP Chip.	B 50WV	0.001μF	
D302	G2090271	Diode	1T33	L401	L1190270	M. RFC		100μH	
D303	G2090108	Diode	1SV68	IF UNIT					
D304	G2090108	Diode	1SV68		F2876104	Printed Circuit Board			
D305	G2090044	Diode	MC301		C028764AB	PCB With Component			
R301	J24205563	RES Chip.	1/10W	56kΩ	Q501	G1090617	IC	TK10420	
R302	J24205563	RES Chip.	1/10W	56kΩ	Q502	G3316237F	Transistor	2SC1623-T2BL6	
R303	J24205152	RES Chip.	1/10W	1.5kΩ	D501	G2070003	Diode	1SS226 TE85R	
R304	J24205223	RES Chip.	1/10W	22kΩ	X501	H0102583	XTAL	HC-18/T 10.245MHz	
R305	J24205563	RES Chip.	1/10W	56kΩ	CD501	H7900260	Ceramic DISC	D455C	
R306	J24205563	RES Chip.	1/10W	56kΩ	R503	J24205182	RES Chip.	1/10W	1.8kΩ
R307	J24205152	RES Chip.	1/10W	1.5kΩ	R504	J24205182	RES Chip.	1/10W	1.8kΩ
R308	J24205103	RES Chip.	1/10W	10kΩ	R505	J24205473	RES Chip.	1/10W	47kΩ
R309	J24205332	RES Chip.	1/10W	3.3kΩ					
R310	J24205221	RES Chip.	1/10W	220kΩ					
R311	J24205223	RES Chip.	1/10W	22kΩ					
R312	J24205223	RES Chip.	1/10W	22kΩ					
R313	J24205223	RES Chip.	1/10W	22kΩ					
R314	J24205470	RES Chip.	1/10W	47kΩ					
C301	K22170211	CAP Chip.	CH 50WV	10pF					
C302	K22170215	CAP Chip.	CH 50WV	15pF					



R506	J24205152	RES Chip.	1/10W	1.5kΩ		C028795AB	PCB With Component		
R507	J24205105	RES Chip.	1/10W	1MΩ					
R508	J24205153	RES Chip.	1/10W	15kΩ					
R509	J24205471	RES Chip.	1/10W	470Ω		Q701	G1090559	IC	LA6324M
R510	J24205332	RES Chip.	1/10W	3.3kΩ		Q702	G3316237F	Transistor	2SC1623-T2BL6
R511	J24205474	RES Chip.	1/10W	470kΩ		Q703	G3316237F	Transistor	2SC1623-T2BL6
R512	J24205222	RES Chip.	1/10W	2.2kΩ					
R513	J0125101	Carbon Film RES.	1/8W	100Ω		D701	G2070001	Diode	1SS181 TE85R
R514	J24205223	RES Chip.	1/10W	22kΩ		D702	G2070003	Diode	1SS226 TE85R
R515	J24205683	RES Chip.	1/10W	68kΩ					
C501	K22170805	CAP Chip.	B	50WV 0.001μF	R701	J24205103	RES Chip.	1/10W	10kΩ
C502	K22170327	CAP Chip.	UJ	50WV 47pF	R702	J24205333	RES Chip.	1/10W	33kΩ
C503	K22170337	CAP Chip.	UJ	50WV 120pF	R703	J24205333	RES Chip.	1/10W	33kΩ
C505	K22141904	CAP Chip.	D	25WV 0.1μF	R704	J24205332	RES Chip.	1/10W	3.3kΩ
C506	K22170237	CAP Chip.	CH	50WV 120pF	R705	J24205682	RES Chip.	1/10W	6.8kΩ
C507	K22141904	CAP Chip.	D	25WV 0.1μF	R706	J24205103	RES Chip.	1/10W	10kΩ
C508	K22170801	CAP Chip.	B	50WV 470pF	R707	J24205223	RES Chip.	1/10W	22kΩ
C509	K22170801	CAP Chip.	B	50WV 470pF	R708	J24205104	RES Chip.	1/10W	100kΩ
C510	K22170817	CAP Chip.	B	50WV 0.01μF	R709	J24205154	RES Chip.	1/10W	150kΩ
C511	K22170801	CAP Chip.	B	50WV 470pF	R710	J24205102	RES Chip.	1/10W	1kΩ
C512	K22170235	CAP Chip.	CH	50WV 100pF	R711	J24205104	RES Chip.	1/10W	100kΩ
C513	K22170817	CAP Chip.	B	50WV 0.01μF	R712	J24205332	RES Chip.	1/10W	3.3kΩ
C514	K22170817	CAP Chip.	B	50WV 0.01μF	R713	J24205331	RES Chip.	1/10W	330Ω
C515	K22170817	CAP Chip.	B	50WV 0.01μF	R714	J24205000	RES Chip.	1/10W	0Ω
C516	K22170805	CAP Chip.	B	50WV 0.001μF	R715	J24205000	RES Chip.	1/10W	0Ω
C517	K22141904	CAP Chip.	D	25WV 0.1μF	R716	J24205472	RES Chip.	1/10W	4.7kΩ
C518	K22170235	CAP Chip.	CH	50WV 100pF	R717	J24205471	RES Chip.	1/10W	470Ω
					TH701	G9090013	Thermistor		112501-2
AF UNIT									
Symbol No.	Part No.	Description	Device		C701	K22141904	CAP Chip.	D	25WV 0.1μF
	F2879103A	Printed Circuit Board			C702	K22170805	CAP Chip.	B	50WV 0.001μF
	C028793AB	PCB With Component			C703	K22170805	CAP Chip.	B	50WV 0.001μF
					C704	K22170805	CAP Chip.	B	50WV 0.001μF
Q601	G3802087Y	FET	2SK208Y TE85R		C705	K22170805	CAP Chip.	B	50WV 0.001μF
Q602	G3316237F	Transistor	2SC1623-T2BL6		C706	K22170821	CAP Chip.	B	50WV 0.002μF
Q603	G3316237F	Transistor	2SC1623-T2BL6		C707	K22170817	CAP Chip.	B	50WV 0.01μF
Q604	G3316237F	Transistor	2SC1623-T2BL6		C708	K22170817	CAP Chip.	B	50WV 0.01μF
Q605	G3316237F	Transistor	2SC1623-T2BL6		C709	K22171008	CAP Chip.	F	50WV 0.047μF
					C710	K22170805	CAP Chip.	B	50WV 0.001μF
					MIC AMP UNIT				
						F2876101	Printed Circuit Board		
						C028761AB	PCB With Component		
R601	J24205104	RES Chip.	1/10W	100kΩ	Q801	G3316237F	Transistor	2SC1623-T2BL6	
R602	J24205104	RES Chip.	1/10W	100kΩ	Q802	G1090559	IC	LA6324M	
R603	J24205105	RES Chip.	1/10W	1MΩ					
R604	J24205564	RES Chip.	1/10W	560kΩ	R801	J24205472	RES Chip.	1/10W	4.7kΩ
R605	J24205224	RES Chip.	1/10W	220kΩ	R802	J24205223	RES Chip.	1/10W	22kΩ
R607	J24205332	RES Chip.	1/10W	3.3kΩ	R803	J24205104	RES Chip.	1/10W	100kΩ
R608	J24205102	RES Chip.	1/10W	1kΩ	R804	J24205474	RES Chip.	1/10W	470kΩ
R609	J24205104	RES Chip.	1/10W	100kΩ	R805	J24205472	RES Chip.	1/10W	4.7kΩ
R610	J24205104	RES Chip.	1/10W	100kΩ	R806	J24205332	RES Chip.	1/10W	3.3kΩ
R611	J24205103	RES Chip.	1/10W	10kΩ	R807	J24205472	RES Chip.	1/10W	4.7kΩ
R612	J24205103	RES Chip.	1/10W	10kΩ	R808	J24205103	RES Chip.	1/10W	10kΩ
R613	J24205471	RES Chip.	1/10W	470Ω	R809	J24205472	RES Chip.	1/10W	4.7kΩ
R614	J24205472	RES Chip.	1/10W	4.7kΩ	R810	J24205472	RES Chip.	1/10W	4.7kΩ
R615	J24205472	RES Chip.	1/10W	4.7kΩ	R811	J24205105	RES Chip.	1/10W	1MΩ
R616	J24205103	RES Chip.	1/10W	10kΩ	R812	J24205104	RES Chip.	1/10W	100kΩ
R617	J24205472	RES Chip.	1/10W	4.7kΩ	R813	J24205472	RES Chip.	1/10W	4.7kΩ
R618	J24205103	RES Chip.	1/10W	10kΩ	R814	J24205224	RES Chip.	1/10W	220kΩ
R619	J24205224	RES Chip.	1/10W	220kΩ	R815	J24205472	RES Chip.	1/10W	4.7kΩ
R620	J24205223	RES Chip.	1/10W	22kΩ	E816	J24205224	RES Chip.	1/10W	220kΩ
R621	J24205000	RES Chip.	1/10W	0Ω	R817	J24205104	RES Chip.	1/10W	100kΩ
R622	J24205101	RES Chip.	1/10W	100Ω	R818	J24205474	RES Chip.	1/10W	470kΩ
R623	J24205334	RES Chip.	1/10W	330kΩ	R819	J24205472	RES Chip.	1/10W	4.7kΩ
R624	J24205104	RES Chip.	1/10W	100kΩ	R820	J24205103	RES Chip.	1/10W	10kΩ
R625	J24205334	RES Chip.	1/10W	330kΩ	R821	J24205103	RES Chip.	1/10W	10kΩ
					R822	J24205103	RES Chip.	1/10W	10kΩ
C601	K22170817	CAP Chip.	B	50WV 0.01μF	R823	J24205472	RES Chip.	1/10W	4.7kΩ
C602	K22170817	CAP Chip.	B	50WV 0.01μF	R824	J24205472	RES Chip.	1/10W	4.7kΩ
C603	K22141904	CAP Chip.	D	25WV 0.1μF	R825	J24205101	RES Chip.	1/10W	100kΩ
C605	K22170817	CAP Chip.	B	50WV 0.01μF	R826	J24205000	RES Chip.	1/10W	0Ω
C606	K22170817	CAP Chip.	B	50WV 0.01μF					
C607	K22170811	CAP Chip.	B	50WV 0.0033μF	C801	K22170813	CAP Chip.	B	50WV 0.0047μF
C608	K22170817	CAP Chip.	B	50WV 0.01μF	C802	K22170235	CAP Chip.	CH	50WV 100pF
C609	K22170817	CAP Chip.	B	50WV 0.01μF	C803	K22170805	CAP Chip.	B	50WV 0.001μF
C610	K22170805	CAP Chip.	B	50WV 0.001μF	C804	K22141808	CAP Chip.	B	25WV 0.047μF
					C805	K22170247	CAP Chip.	CH	50WV 330pF
METER UNIT									
Symbol No.	Part No.	Description	Device						
	F2879105	Printed Circuit Board							



C806	K22141808	CAP Chip.	B 25WV 0.047uF
C807	K78120013	CAP Chip.	16WV 1uF
C808	K22141904	CAP Chip.	D 25WV 0.1uF
C809	K22141904	CAP Chip.	D 25WV 0.1uF
C810	K22170815	CAP Chip.	B 50WV 0.0068uF
C811	K22140806	CAP Chip.	B 25WV 0.018uF
C812	K22170805	CAP Chip.	B 50WV 0.001uF
C813	K78120013	CAP Chip.	16WV 1uF

**SCAN UNIT**

Symbol No.	Part No.	Description	Device
	F2905101	Printed Circuit Board	
	C029051AB	PCB With Component	
Q901	G3070001	Transistor	FA1A4M-T2B
Q902	G1090814	IC	uPD4538BG
D901	G2090389	Diode	1SS133
D902	G2070009	Diode	1SS184TE85R
D903	G2070001	Diode	1SS181TE85R
R901	J24205684	RES Chip.	1/10W 680kΩ
R902	J24205684	RES Chip.	1/10W 680kΩ
R903	J24205103	RES Chip.	1/10W 10kΩ
R904	J24205474	RES Chip.	1/10W 470kΩ
R905	J24205104	RES Chip.	1/10W 100kΩ
R906	J24205104	RES Chip.	1/10W 100kΩ
C901	K70087475	Tantalum CAP.	6.3WV 4.7uF
C902	K70087475	Tantalum CAP.	6.3WV 4.7uF
SW901	N6090051	Slide Switch	SSS-212229

**CNTL UNIT**

Symbol No.	Part No.	Description	Device
	Q7000061A	CNTL UNIT A*	
	Q7000062A	CNTL UNIT B**	
Q2001	G1090767	IC	HD613901A78
BAT2001	Q9000390	Lithium Battery	CR2032-HP4H

\* Version A1, A2 (U), A2, F

\*\* Version B, C, D, E



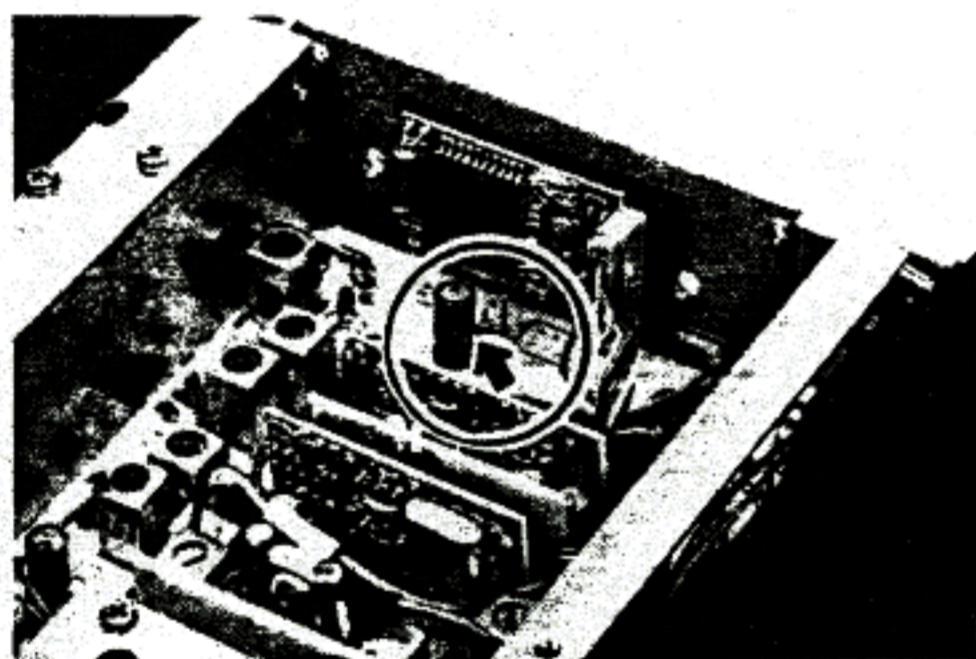
# FTS-12 TONE SQUELCH UNIT INSTALLATION

The FTS-12 provides either encode-only or encode/decode operation with 37 front panel selectable subaudible CTCSS tones. See the "Operation" section of the Operating Manual for functional details.

- (1) Disconnect the power cable at the rear of the transceiver, and remove the five screws affixing the bottom cover\*. Remove the cover carefully so as not to pull on the speaker wires, and lay the set upside down.
- (2) Locate the unconnected brown 11-pin connector at the front right corner on the Main Board just behind the tuning knob. Align the small tab on one side of this connector with the hole in one side of the FTS-12 connector, and mate these connectors.
- (3) Now locate the double-sided adhesive tape pre-installed on the inside of the side panel. Remove the paper covering from this tape, and press the FTS-12 against it as shown in the photo below.

- (4) On the main circuit board near the FTS-12 mounting position, notice a 27-kilohm resistor (red, violet and orange bands). Cut the exposed lead of this resistor. If the FTS-12 is removed from the transceiver, this resistor must be reconnected.
- (5) Replace the bottom cover. The output tone level (VR1 on the FTS-12) is adjusted at the factory for the proper deviation, so no adjustment should be necessary.

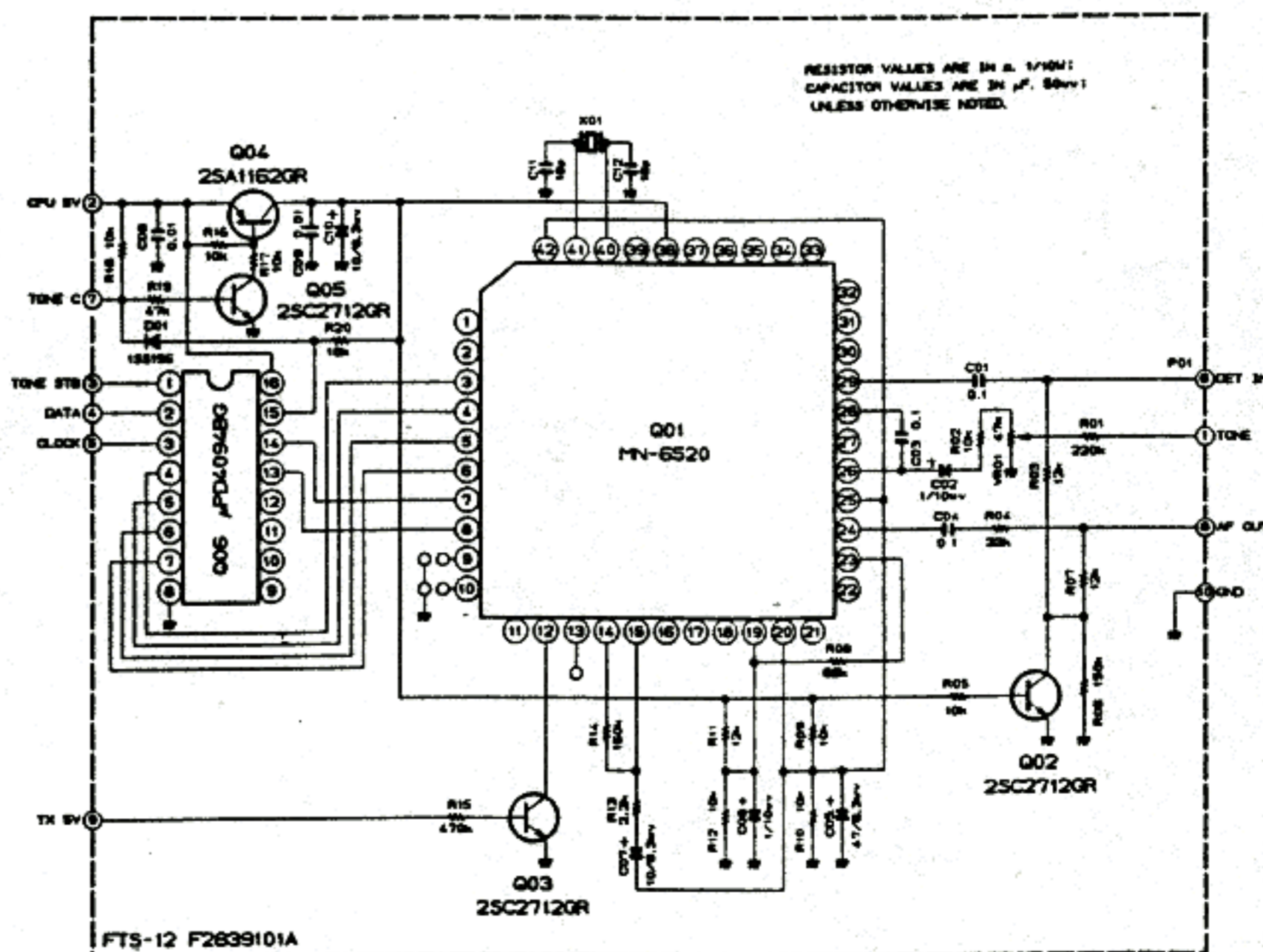
\* If the front panel has not been reversed (ie., angles upwards), the bottom panel is the larger panel which includes the loudspeaker. Otherwise, the bottom panel is the smaller one.



Cut indicated resistor

Provided by  <http://www.yaesu-museum.com/>  
  
 Downloaded by  Amateur Radio Directory

CTCSS Tone Frequency (Hz)			
67.0	100.0	141.3	203.5
71.9	103.5	146.2	210.7
74.4	107.2	151.4	218.1
77.0	110.9	156.7	225.7
79.7	114.8	162.2	233.6
82.5	118.8	167.9	241.8
85.4	123.0	173.8	250.3
88.5	127.3	179.9	—
91.5	131.8	186.2	—
94.8	136.5	192.8	—





## FTS-12 PARTS LIST

FTS-12 PARTS LIST			
Symbol No.	Part No.	Description	Device
	F2839101A	Printed Circuit Board	
	C028391AA	P.C.B with Components	
Q01	G1090577	IC	MN6520
Q02	G3327127G	Transistor	2SC2712GRTE85R
Q03	G3327127G	Transistor	2SC2712GRTE85R
Q04	G3111627G	Transistor	2SA1162GRTE85R
Q05	G3327127G	Transistor	2SC2712GR
Q06	G1090696	IC	μPD4094BG
D01	G2070026	Diode	1SS196TE85R
R01	J24205224	RES Chip.	1/10W 220kΩ
R02	J24205103	RES Chip.	1/10W 10kΩ
R03	J24205123	RES Chip.	1/10W 12kΩ
R04	J24205333	RES Chip.	1/10W 33kΩ
R05	J24205103	RES Chip.	1/10W 10kΩ
R06	J24205154	RES Chip.	1/10W 150kΩ
R07	J24205123	RES Chip.	1/10W 12kΩ
R08	J24205683	RES Chip.	1/10W 68kΩ
R09	J24205103	RES Chip.	1/10W 10kΩ
R10	J24205103	RES Chip.	1/10W 10kΩ
R11	J24205153	RES Chip.	1/10W 15kΩ
R12	J24205123	RES Chip.	1/10W 12kΩ
R13	J24205222	RES Chip.	1/10W 2.2kΩ
R14	J24205154	RES Chip.	1/10W 150kΩ
R15	J24205474	RES Chip.	1/10W 470kΩ
R16	J24205103	RES Chip.	1/10W 10kΩ
R17	J24205103	RES Chip.	1/10W 10kΩ
R18	J24205103	RES Chip.	1/10W 10kΩ
R19	J24205473	RES Chip.	1/10W 47kΩ
R20	J24205103	RES Chip.	1/10W 10kΩ
R21	J24205000	RES Chip.	1/10W 0Ω
VR01	J51771503	POT.	B 50kΩ
C01	K22141809	CAP Chip.	B 25WV 0.1μF
C02	K78120013	Tantalum CAP.	16WV 1μF
C03	K22141809	CAP Chip.	B 25WV 0.1μF
C04	K22141809	CAP Chip.	B 25WV 0.1μF
C05	K78080013	Tantalum CAP.	6.3WV 47μF
C06	K78120013	Tantalum CAP.	16WV 1μF
C07	K78080003	Tantalum CAP.	6.3WV 10μF
C08	K22170817	CAP Chip.	B 50WV 0.01μF
C09	K22170817	CAP Chip.	B 50WV 0.01μF
C10	K78080003	Tantalum CAP.	6.3WV 10μF
C11	K22170217	CAP Chip.	CH 50WV 18pF
C12	K22170217	CAP Chip.	CH 50WV 18pF
X01	H0102571	XTAL	4.194304MHZ
J01	P0090600	Connector	

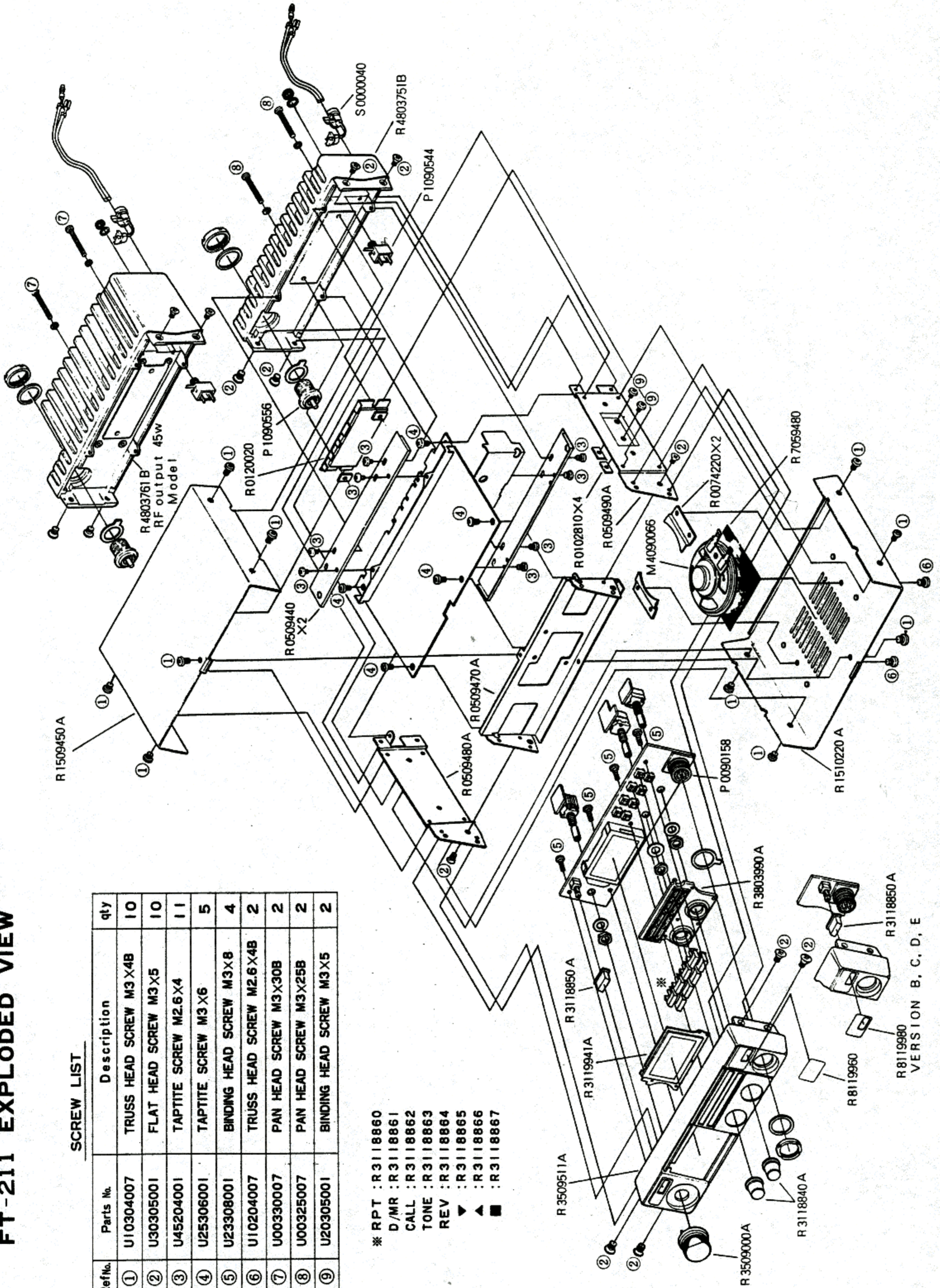


# FT-211 EXPLODED VIEW

## SCREW LIST

RefNo.	Parts No.	Description	qty
①	U10304007	TRUSS HEAD SCREW M3X4B	10
②	U30305001	FLAT HEAD SCREW M3X5	10
③	U45204001	TAPTITE SCREW M2.6X4	11
④	U25306001	TAPTITE SCREW M3X6	5
⑤	U23308001	BINDING HEAD SCREW M3X8	4
⑥	U10204007	TRUSS HEAD SCREW M2.6X4B	2
⑦	U00330007	PAN HEAD SCREW M3X30B	2
⑧	U00325007	PAN HEAD SCREW M3X25B	2
⑨	U20305001	BINDING HEAD SCREW M3X5	2

\* RPT : R3118860  
 D/MR : R3118861  
 CALL : R3118862  
 TONE : R3118863  
 REV : R3118864  
 ▼ : R3118865  
 ▲ : R3118866  
 ■ : R3118867



R8119980  
 VERSION B, C, D, E