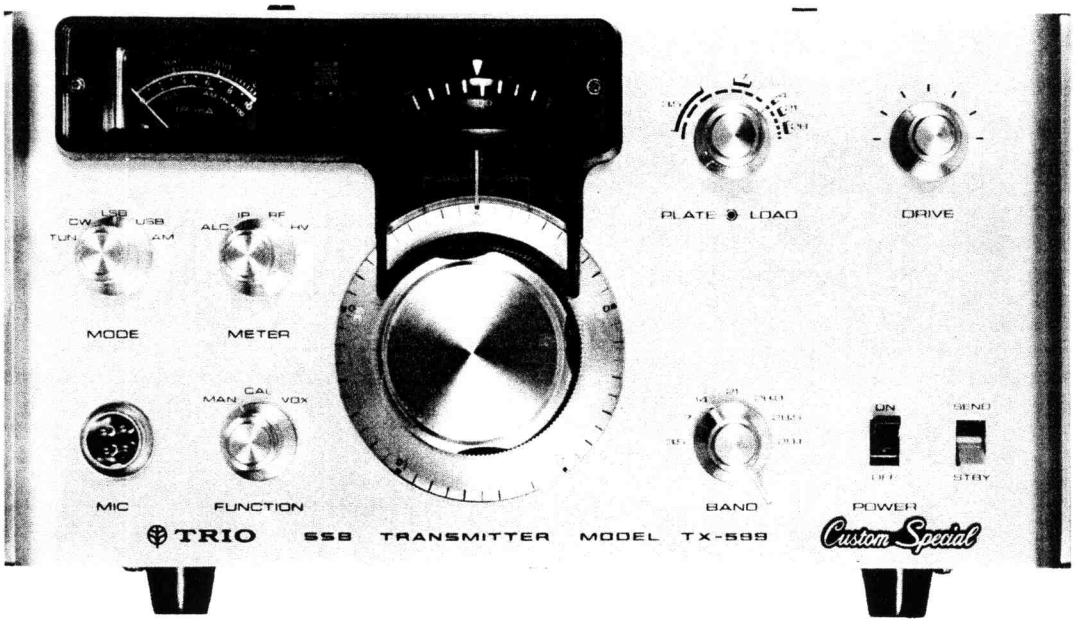
TRIO

SERVICE MANUAL

TX-599

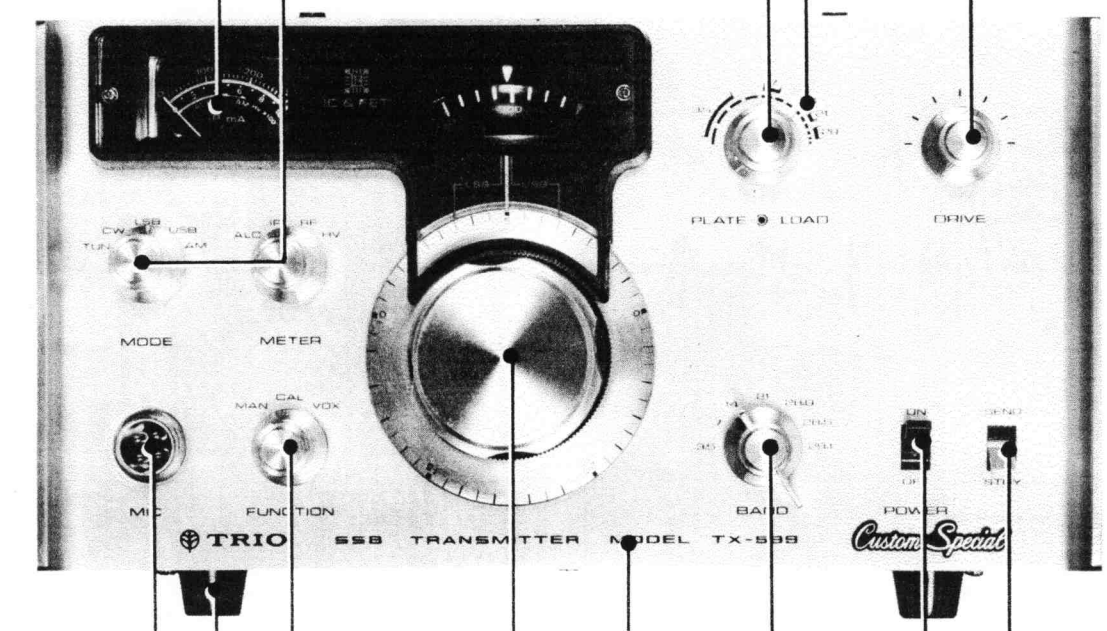


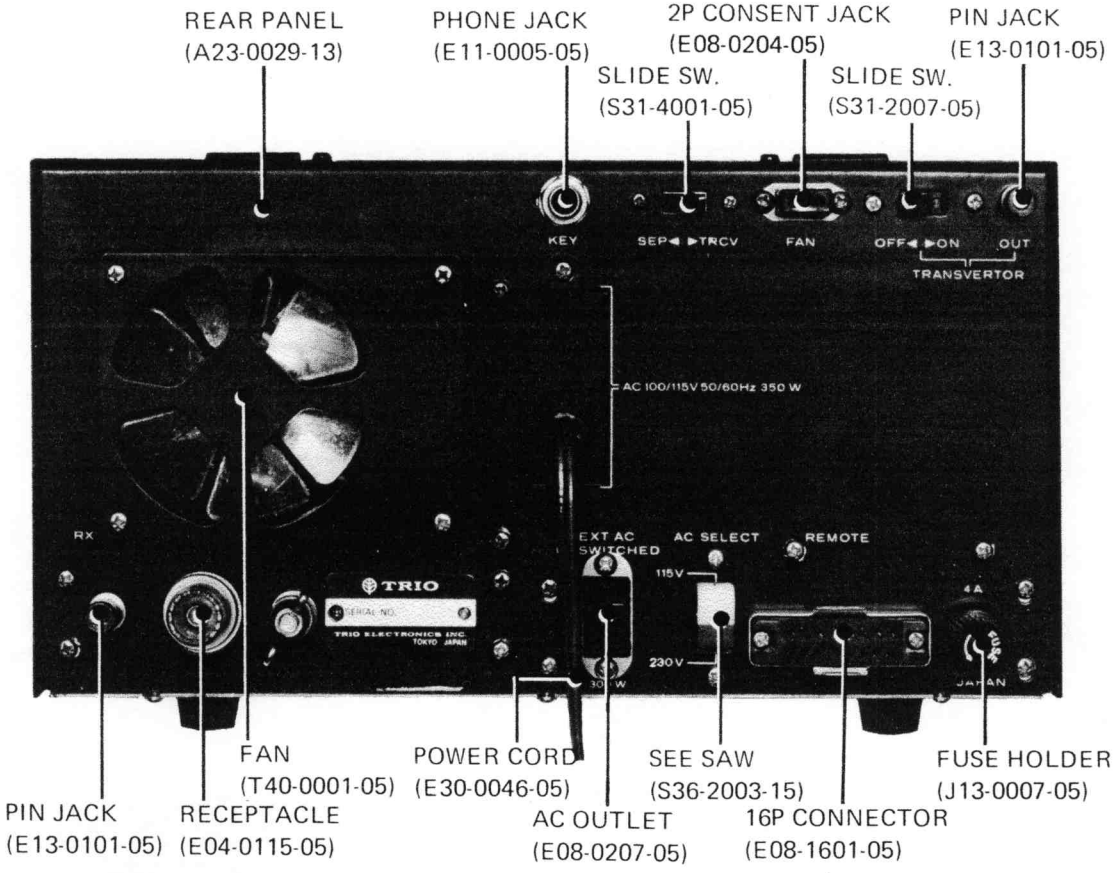
ALL BAND SSB TRANSMITTER

SPECIFICATIONS

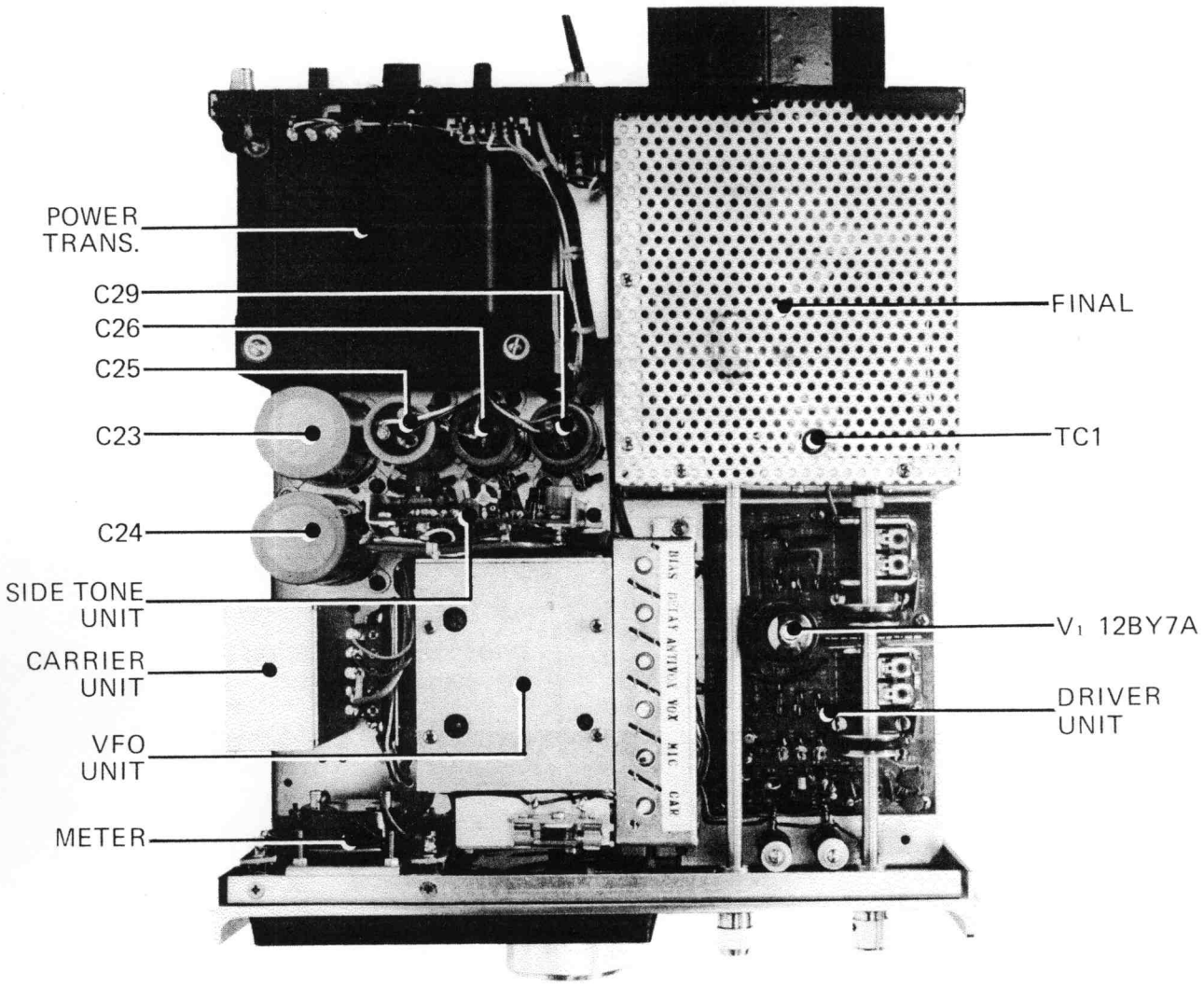
Transmitting Frequency Range:	3.5 MHz band	3.50 ~ 4.00 MHz	
	7.0 MHz band	7.00 ~ 7.50 MHz	
	14.0 MHz band	14.00 ~ 14.50 MHz	
	21.0 MHz band	21.00 ~ 21.50 MHz	
	28.0 MHz band	28.00 ~ 28.50 MHz	
	28.5 MHz band	28.50 ~ 29.10 MHz	
	29.1 MHz band	29.10 ~ 29.70 MHz	
Type of Emission:	SSB (A3J), CW (A1) and AM (A3)		
Rated Input to Final Stage:	SSB, CW	3.5 ~ 14 MHz	160W
		21 MHz	120W
		28 MHz	100W
	AM	3.5 ~ 14 MHz	80W
		21 MHz	60W
		28 MHz	50W
Carrier Suppression:	−40 dB or less		
Unwanted Sideband Suppression:	−40 dB or less		
Harmonics Radiation:	−40 dB or less (under CW operation)		
Output Impedance:	50 ~ 75Ω		
Microphone Input Impedance:	600 and 50 kΩ, as selected by a selector switch		
Modulation System:	Balanced modulation for SSB and low-power modulation for AM		
SSB Generation System:	Filter system		
Transmitting Frequency Characteristics:	300 ~ 2700 Hz (−6 dB)		
Keying:	Block bias keying		
Frequency Stability:	Within ±2 kHz from one minute after switching on the set to 60 minutes and later within ±100 Hz per 15 minutes.		
Tubes and Semiconductors Employed:	3 vacuum tubes, 4 FET, 1 IC, 29 transistors, 33 diodes, 3 zener diodes & 1 varicap.		
Power Consumption:	350 W max.		
Dimensions:	10-5/8"W x 5-1/2"H x 12-3/16"D (inches) 270W x 140H x 310D (mm)		
Weight:	12.5 kg (26.4 lbs)		

● EXTERNAL VIEW

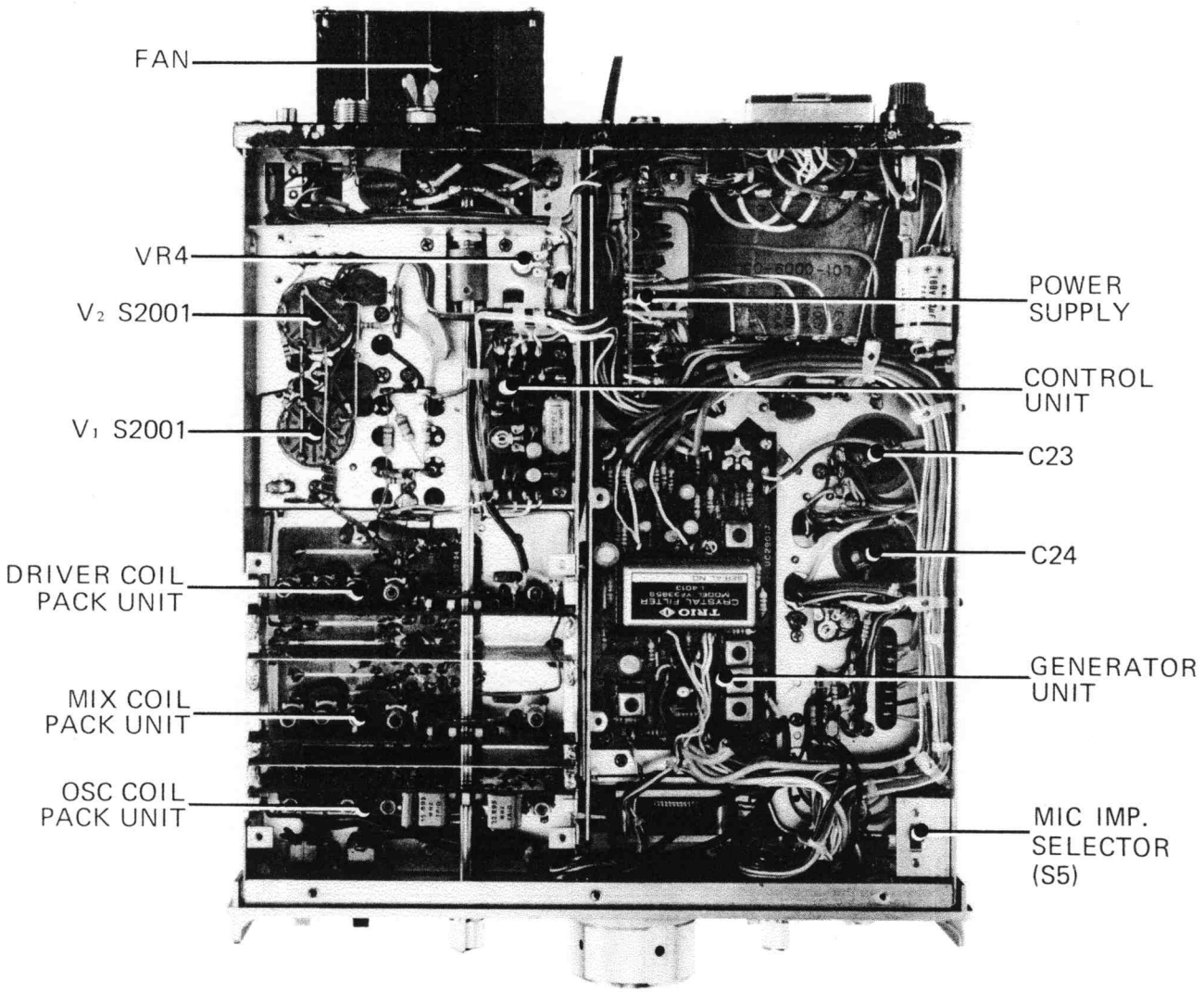




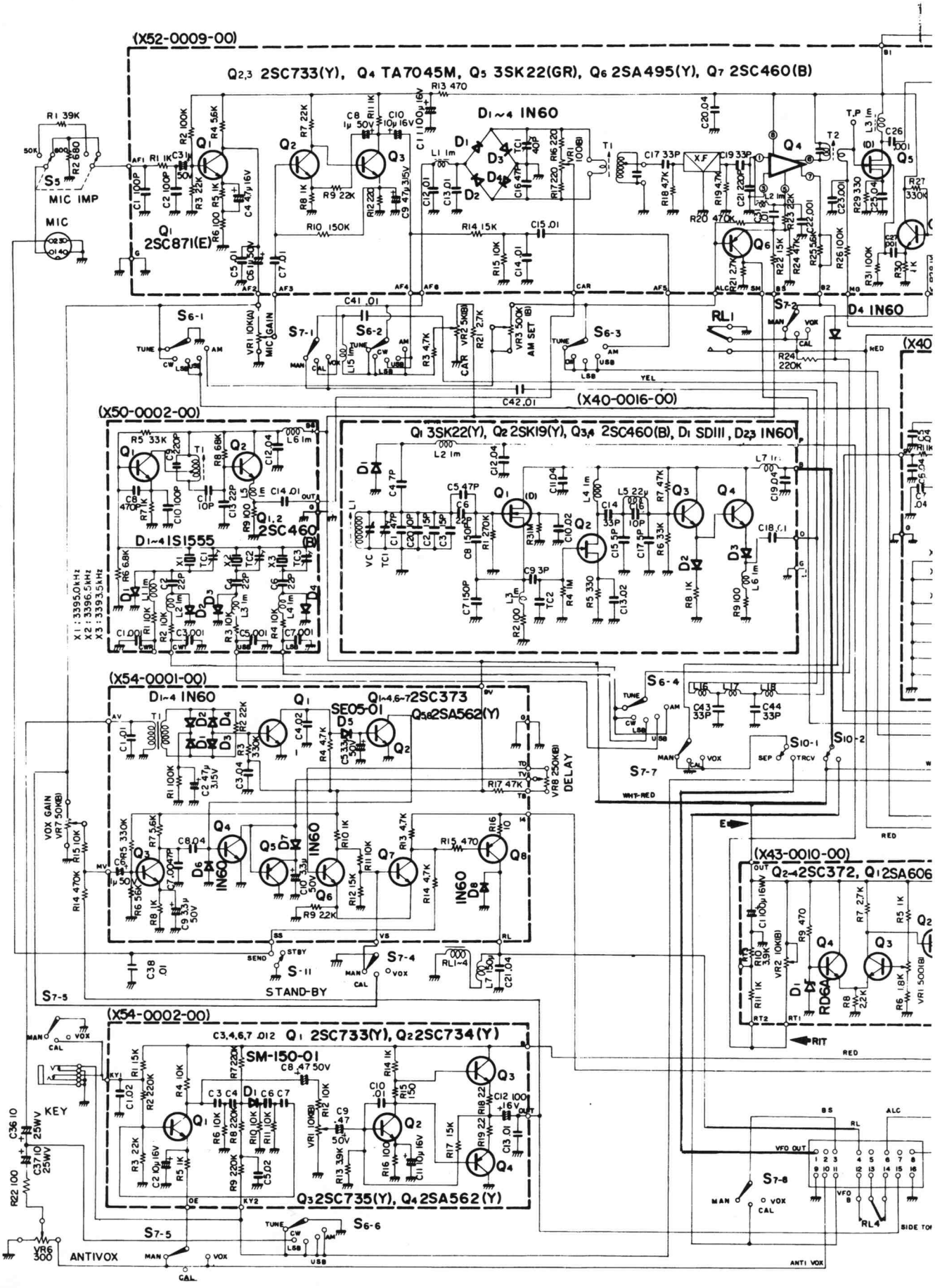
● TOP CHASSIS VIEW

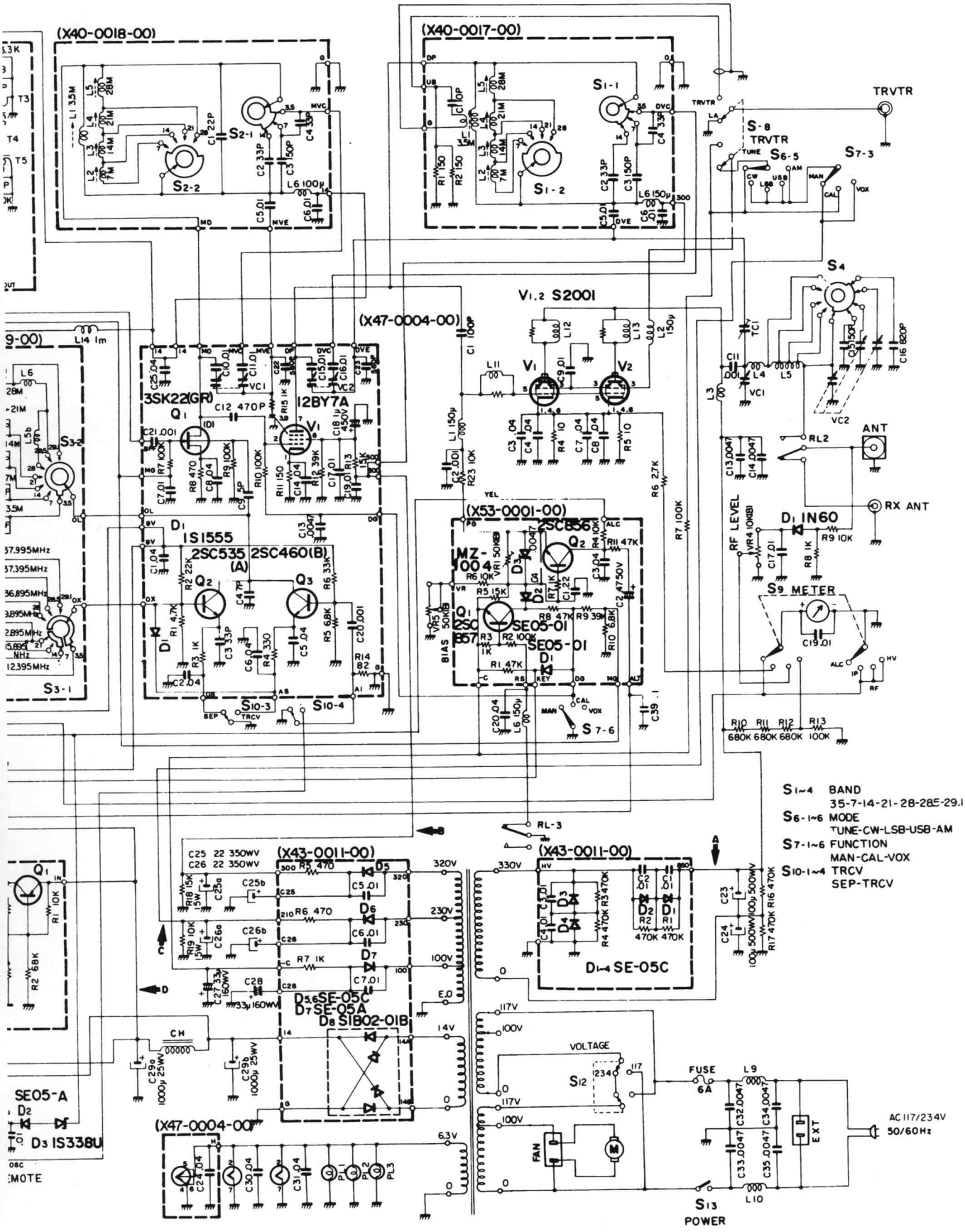


● BOTTOM CHASSIS VIEW



● SCHEMATIC DIAGRAM





TX-599

● TROUBLESHOOTING CHART

SYMPTOM	CHECK POINT	ADJUST
NO OUTPUT IN EVERY BAND	X50-0002-00	See the I) in page 8
	X40-0016-00	See the II) In page 9
SMALL OUTPUT IN EVERY BAND	X40-0017-00 X40-0018-00 X47-0004-00	See the III) in page 10
	X52-0009-00	See the IV) in page 11
	S-2001	See the V) in page 11
NO OUTPUT IN SPECIFIED BAND	X40-0019-00	See the III) in page 10
NOT TO TRANSMIT ON "SSB"	X52-0009-00	See the IV) in page 11
NOT TO TRANSMIT ON "CW"	X54-0001-00	See the VII) in page 12
	X54-0002-00	See the VI) in page 12
NOT TO WORK ON "ALC"	X53-0001-00	Check the BIAS voltage and Q_2 , Q_3 in it.
	X52-0009-00	See the IV) in page 11
	X40-0017-00	See the III) in page 10
NOT TO WORK ON "VOX"	X54-0001-00	See the VII) in page 12
ABNORMAL ON "POWER SUPPLY VOLTAGE"	X43-0010-00	See the VIII) in page 12
	X43-0011-00	See the VIII) in page 12

● ADJUSTMENT

I) CARRIER LEVEL AND RF METER SENSITIVITY

PURPOSE: To set the CW and AM carrier level and the RF meter sensitivity.

INSTRUMENT: Power meter (100 watts minimum)

Method of Adjustment:

(1) Connect the power meter to ANT terminal.
(2) Set as follows: BAND to 14 MHz; VFO dial to 175 calibrations on the scale; DRIVE knob to 12 o'clock position; PLATE variable capacitor to 14 MHz.
(3) Turn MODE switch to CW.
(4) Move the SEND/STBY switch to SEND, and quickly adjust the IP dip. So that maximum power will be obtained, adjust DRIVE, PLATE and LOAD knob.
(5) Turn METER switch ALC, and adjust CAR variable resistor (VR5) on the top chassis (next to VFO) to obtain a deflection of 200 mA point on the IP scale.

NOTE: (a) A final stage out of tune is liable to damage S2001. This stage should be tuned perfectly as soon as possible.
(b) In case of the IP current flowing 150 mA or more, it takes a minute to adjust and a half minute to not adjust.

(6) Turn MODE switch to CW and METER switch to RF, and re-tune each section. Bring the pointer to 200 mA on the IP scale by adjusting the semi-fixed variable resistor (VR4) for RF meter sensitivity.
(7) Move BAND switch to 28.5 MHz, and produce maximum power output. Under this condition, turn MODE switch to AM and adjust the semi-fixed variable resistor (VR3) of AM SET under the chassis, next to the GENERATOR, in such a manner that the power meter will indicate 10 watts. If the meter does not indicate so much as 10 watts, re-adjust VR3, with CAR variable resistor (VR2) set at MAX.
(8) Move BAND switch to 3.5 MHz and VFO dial to 030 calibrations on the scale and, in the manner similar to step (2) above, make sure that a power output of at least 80 watts is available, with BAND switch at 14 MHz position. Do not touch the variable resistor for carrier level setting.
(9) In the similar manner, make sure that at least 80 watts is available at 7.050 MHz, at least 60 watts at 21.225 MHz, and at least 50 watts at 28.3 MHz, 28.8 MHz and 29.1 MHz, respectively.

BALANCED MODULATOR AND CARRIER POSITION ADJUSTMENT

PURPOSE: To balance the balanced modulator (BM), and to correct the carrier position.

INSTRUMENT: Power meter (at least 100 watts)
RF-VTVM
Audio generator
AF-VTVM

Method of Adjustment (Fig. 1):

(1) Connect the power meter and RF-VTVM to ANT terminal. Use the highest range.
(2) Move MODE switch to CW and produce maximum output power at 14.175 MHz.
(3) Under this condition, turn MODE switch LSB. Adjust the carrier-balancing semi-fixed variable resistor (VR1) and trimmer (TC1)-on generator unit (X52-0009-00) so that RF-VTVM indication will be minimum.
(4) Using the highest voltage range of RF-VTVM, supply 1500 Hz at 5 mV to MIC terminal, and adjust MIC GAIN variable resistor (VR1) – next to VFO on top chassis – to obtain 50 watts from the output.
(5) Switch the signal to 400 Hz and 2600 Hz, checking the output power each time, and adjust the trimmer (TC3) in the carrier unit (X50-0002-00) so that the two output power readings will not differ by more than 5 watts.
(6) Turn MODE switch to USB, and take output power readings for 400 Hz and 2600 Hz as in step (5) above, and adjust the trimmer (TC2) to reduce the difference of the two readings within 5 watts.
(7) Disconnect the audio generator from MIC terminal, and have MIC GAIN variable resistor turned to MIN.
(8) Again move MODE switch to LSB, and adjust the balancing variable resistor and trimmer of the generator unit (X52-0009-00), as in step (3) above, in order to bring down RF-VTVM indication to minimum.
(9) Move MODE switch to USB. This will raise the indication of RF-VTVM. Adjust the variable resistor and trimmer to the minimum point at which RF-VTVM will give the same indication for both USB and LSB positions of MODE switch. Left that indication be represented by A. (If the voltmeter indication should drop when the switch is turned from LSB to USB, do not re-adjust the variable resistor and trimmer: take the indication for LSB as A.)
(10) Set the ATT of RF-VTVM to the maximum position.

● ADJUSTMENT

(11) Supply 1500 Hz signal at 5 mV to MIC terminal. With MIC GAIN variable resistor maximum, check to be sure that an output power of at least 80 watts is available. Let the VTVM indication at this time be represented by B.

(12) Be sure that the difference between two readings A and B is at least 40 dB.

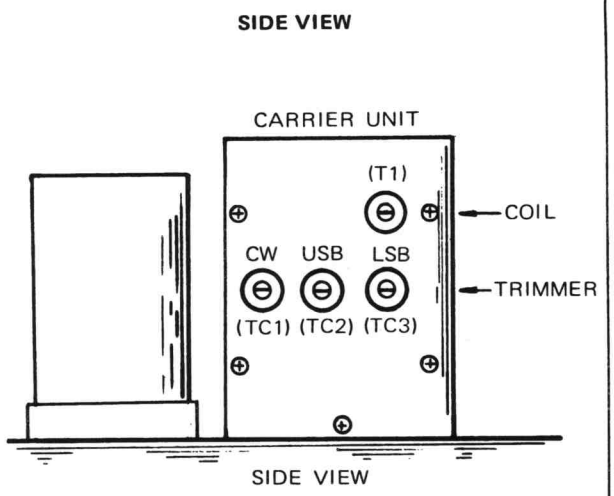


Fig. 1 LOCATION OF COIL AND TRIMMER IN CARRIER UNIT

II) VFO ADJUSTMENT (X40-0016-00)

PURPOSE: As VFO oscillation ceases, the transmitter becomes incapable of all-band transmission. To set VFO output voltage. To adjust oscillation frequency.

INSTRUMENT: RF-VTVM. Frequency counter.

Method of Adjustment (Fig. 2, 3):

(1) Connect the VTVM and counter to VFO-unit OUT terminal. Adjust TC2 to obtain 1 V output voltage.

(2) Match the VFO dial to zero calibrations. Check to be sure the oscillation frequency is 5.5 MHz. If not, adjust by using TC1.

(3) Match the VFO dial to 600 calibrations. Check to be sure the oscillation frequency is 4.9 MHz: if not adjust by using L1.

(4) Repeat steps (2) and (3) above two to three times to obtain the desired end.

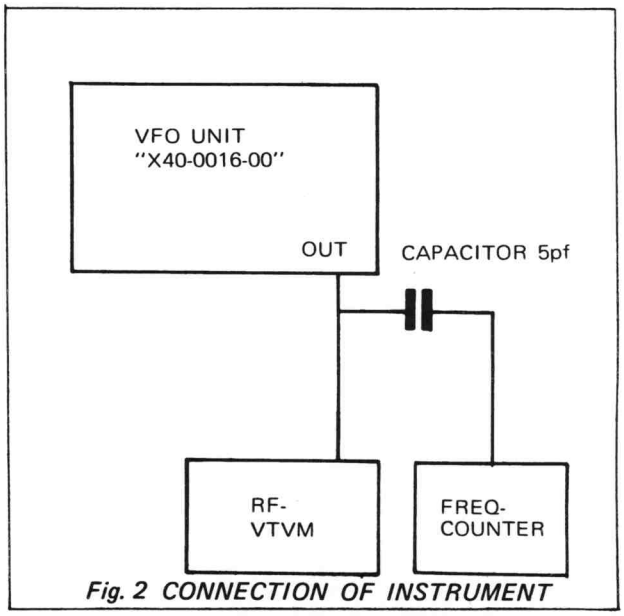


Fig. 2 CONNECTION OF INSTRUMENT

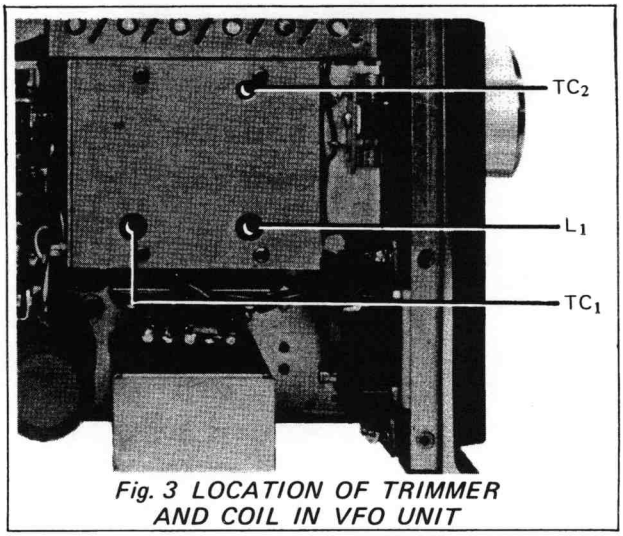


Fig. 3 LOCATION OF TRIMMER AND COIL IN VFO UNIT

III) ADJUSTMENT OF HETERODYNE OSCILLATOR COIL (X47-0004-00)

PURPOSE: To confirm the oscillation of heterodyne crystal oscillator.
INSTRUMENT: RF-VTVM

Method of Adjustment (Fig. 4):

(1) Connect the VTVM to MD terminal of driver unit (X47-0004-00) through a 0.01μf capacitor.
(2) Set the band switch to 3.5 MHz.
(3) Turn SEND/STABY switch to SEND.
(4) Rotate the core of 3.5 MHz oscillator coil in the direction for moving the core out until the oscillator voltage decreases by about 0.5 dB from its maximum value.
(5) Similarly adjust each of the 7-, 14-, 21- and 28.5 MHz bands.
(6) Make sure that oscillation is normal for 28.0 MHz and 29.1 MHz bands. In case of no oscillation or an excessive difference, re-adjust the 28.5 MHz oscillator coil so that the same or nearly same level of output will be available for 28-, 28.5- and 29.1 MHz bands.

ADJUSTMENT OF 2ND MIXER AND DRIVER PLATE COIL

PURPOSE: To tune up coils of every bands.
INSTRUMENT: RF-VTVM

Method of Adjustment (Fig. 5):

(1) Connect the VTVM to the grid (pin 5) of S2001 through 1pf capacitor.
(2) Turn the DRIVE knob to 12 o'clock position. At this time, check to be sure there is no offset in dial calibrations on both sides of the DRIVE knob.
(3) Position the knobs as follows: MODE TUN or CW; FUNCTION MAN, and METER ALC. Turn the SEND/STBY knob from STBY to SEND.
(4) With BAND switch turned to 3.5 MHz position and VFO to 250 calibrations on the scale, adjust the coils of X40-0018-00 and X40-0017-00 to obtain the maximum deflection of the VTVM.
(5) When ALC meter begins to swing, disconnect the VTVM adjust the coils of X40-0018-00 and X40-0017-00 so that a maximum deflection will be obtained.
(6) In the manner similar to the above, adjust every of the *28.5 MHz, 21 MHz, 14 MHz and 7 MHz bands. In the meantime, have VFO dial set as follows:

28.5 MHz . . . . . 300 calibrations
21 MHz . . . . . 225 calibrations
14 MHz . . . . . 175 calibrations
7 MHz . . . . . 150 calibrations

***CAUTION:** *Adjustment is possible only when the procedure is followed in the proper sequence, which is 3.5, 28.5, 21, 14, 7 MHz.*

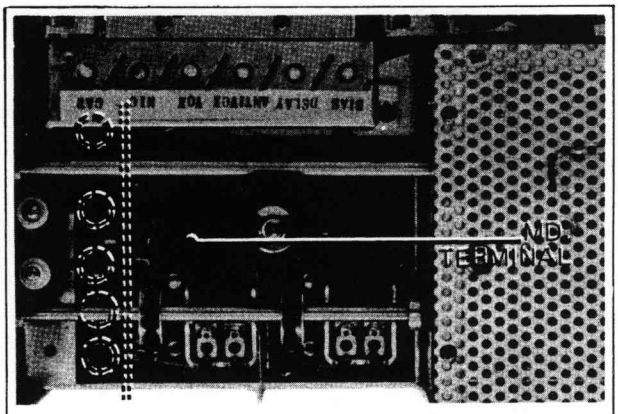


Fig. 4 LOCATION OF MD TERMINAL

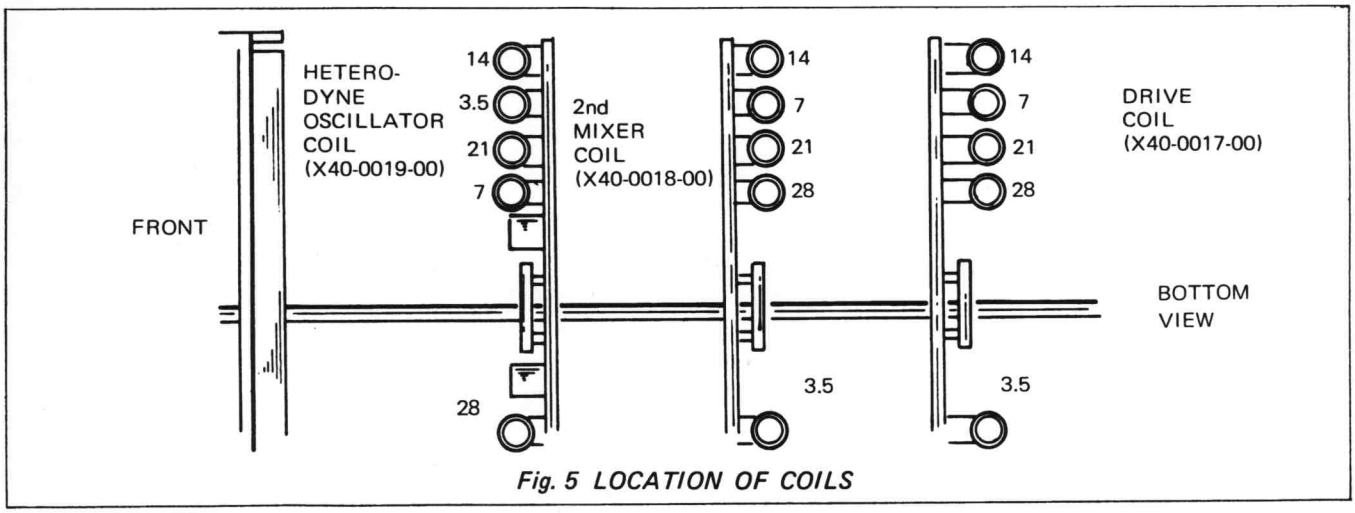


Fig. 5 LOCATION OF COILS

● ADJUSTMENT

IV) ADJUSTMENT OF BPF (X52-0009-00)

PURPOSE: To obtain the required bandwidth by adjusting the band-pass filter (BPF).

INSTRUMENT: Use the sweep generator (8.295 MHz, 8.595 MHz and 8.895 MHz marks). Be sure to use a marked sweep generator. Use a detector (Fig. 6) and an oscilloscope.

Method of Adjustment: (Fig. 7)

(1) Connect sweep generator to T.P. terminal of generator unit (X52-0009-00).
(2) Connect the oscilloscope to the OUT terminal through the prescribed detector.
(3) Adjust coils T_3, T_4 and T_5 to obtain a characteristic as shown Fig. 8.

MIC GAIN

PURPOSE: To set MIC GAIN variable resistor (VR1)

INSTRUMENT: Audio generator.
AF-VTVM

Method of Adjustment:

(1) Set TRANSVERTOR switch to ON on rear panel.
(2) Turn MODE switch to LSB or USB.
(3) Supply 1500 Hz at 5 MV to MIC terminal.
(4) Move the SEND/STBY switch to SEND, and adjust MIC GAIN variable resistor (VR1) to obtain an AF voltage of 0.3 volt at AF6 terminal of the generator unit (X52-0009-00).

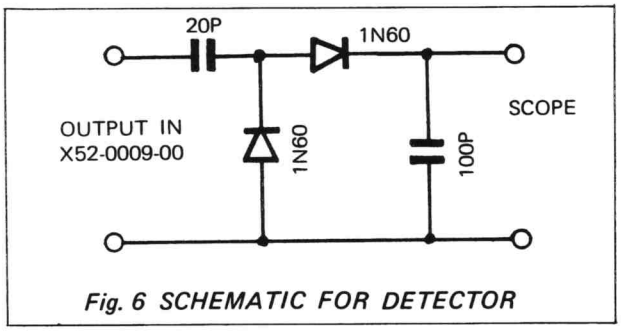


Fig. 6 SCHEMATIC FOR DETECTOR

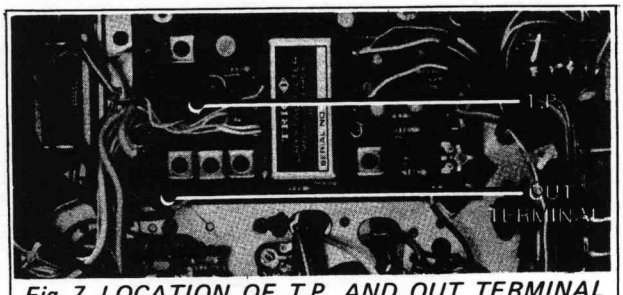


Fig. 7 LOCATION OF T.P. AND OUT TERMINAL

V) FINAL BIASING ADJUSTMENT

PURPOSE: To set the final base current.

INSTRUMENT: No.

Method of Adjustment:

(1) Turn MODE switch to LSB or USB.
(2) Position DRIVE knob at 9 o'clock point.
(3) Turn the BAND switch to 14 MHz position; turn off TRANSVERTOR switch; and move the SEND/STBY switch to SEND.
(4) Turn METER switch to IP, and adjust BIAS variable resistor (VR5) to obtain 60 mA for IP.
(5) Turn PLATE knob and see if IP changes or not. This capacitor should not affect IP.
(6) Restore the SEND/STBY switch STBY.

NEUTRALIZATION ADJUSTMENT

PURPOSE: Carry out RF neutralization on S2001 in order to ensure stable operation.

INSTRUMENT: Power meter (at least 100 watts)
RF-VTVM

Method of Adjustment:

(1) Produce maximum output power at 21.225 MHz (CW).
(2) Under this condition, move TRANSVERTOR switch (on the rear panel) into ON position. This cuts off screen voltage for S2001.
(3) Connect RF-VTVM to ANT terminal. Adjust the neutralizing variable capacitor (TC1), located in the final shield box so that the VTVM deflection will be minimum.
(4) Turn the SEND/STBY switch to STBY, disconnect the VTVM, and turn off TRANSVERTOR switch.
(5) Move the SEND/STBY switch to SEND again, and check to be sure the same maximum power is being delivered as before.

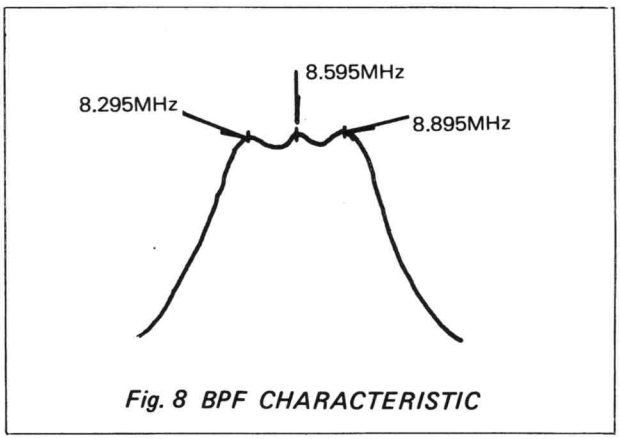


Fig. 8 BPF CHARACTERISTIC

VI) SIDE TONE ADJUSTMENT:

PURPOSE: To set the side tone output level, and to confirm the semi-break-in action.

INSTRUMENT: Power meter (at least 100 watts)
VTVM or oscilloscope
Resistor 50,000 ohms

Method of Adjustment:

(1) Connect the power meter to ANT terminal, and the VTVM, oscilloscope and 50,000 ohms resistor to between REMOTE socket pin (15) and pin (16, ground).
(2) Turn MODE switch to CW, and adjust each knob to obtain maximum output power at 14.175 MHz.
(3) Insert the key into KEY jack, and check to be sure that the RF output power is zero.
(4) Make sure that the proper output appears when the key is pushed. Check the side tone output to be 1V ±2dB.
(5) Move the SEND/STBY switch to STBY, and FUNCTION switch to VOX, push the key to be sure that semi-break-in keying is possible.

VII) VOX OPERATION

PURPOSE: To set the gain and time constants of the VOX circuit.

INSTRUMENT: Audio generator.
VTVM.
Watch (having the second finger).

Method of Adjustment:

(1) Set TRANSVERTOR switch to ON.
(2) Move FUNCTION switch to VOX.
(3) Supply 1500 Hz at 5 mV to MIC terminal, and turn VOX GAIN variable resistor (VR7) on top chassis, next to VFO, until the relay operates.
(4) Upon working of the relay, shut off the AF signal: the relay should reset one second after the shutting off the AF signal. To meet this requirement, adjust DELAY variable resistor (VR8) next to VFO, on top chassis.
(5) Return FUNCTION switch MAN.

VIII) VOLTAGE CHECK

PURPOSE: To make sure the proper voltage is available from the power source and AVR unit.

INSTRUMENT: Use VTVM or tester.

CHECK POINT: (Refer to the SCHEMATIC DIAGRAM)
A: DC 930V ±50V
B: DC 330V ±20V
C: DC 240V ±20V
D: DC 15V ±1V
E: DC 9V ±0.2V
F: DC −95V ±20V
G: AC 6.3V ±0.5V
RIT: DC 5.8V

* If voltage at E is off 9V ±0.2V, adjust VR_1 on AVR unit X43-0011-00 to obtain the specified voltage. Match RIT by adjusting VR_2 on AVR unit.

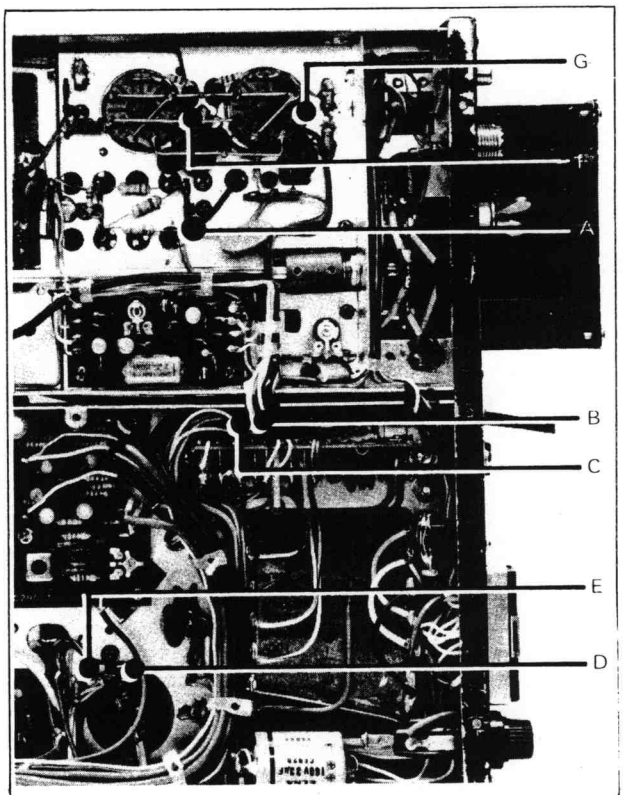


Fig. 9 CHECK POINT OF VOLTAGE

● TABLE OF VOLTAGE

A

Unit No.	Transistor	Note 1	E	B	C
X50-0002-00	Q1 2SC460		0.85	1.4	9.0
	Q2 2SC460		1.55	2.2	9.0
X52-0009-00	Q1 2SC871		1.2	1.9	4.5
	Q2 2SC733		0.35	0.9	2.1
	Q3 2SC733		1.50	2.1	3.8
	Q4 TA7045M	Refer "B" Table			
	Q5 3SK22	R S	Note2/0 0.95	−4.8 0	−2.0 0
	Q6 2SA495	R S	6.8 Note3/2.2	6.2 1.5	0
	Q7 2SC460	R S	2.6 3.1	3.3 3.8	14.5 13.5
X47-0004-00	Q1 3SK22	R S	Note2/0 0.75	−3.75 0	−2.8 −0.5
	Q2 2SC535	SEP TRCV	1.7 0	1.25 0.2	7.5 8.0
	Q3 2SC460	SEP TRCV	2.7 0.87	1.55 1.48	7.5 8.0
	V1 12BY7A	Refer "B" Table			
X53-0001-00	Q1 2SC857	R S	−94 −95	−94 −95	−94 0
	Q2 2SC856	R S	−94 −50	−94 −50	6.3 Note3/1.5

Unit No.	Transistor	Note 1	E	B	C
X54-0001-00	Q1 2SC373	R A	0	0.65 0.6	0.13 0.65
	Q2 2SC373	R A	0	0.23 0.67	0
	Q3 2SC373		0.6	1.2	6.1
	Q4 2SC373	R V	0	0 0.25	8.5 0.65
	Q5 2SA562	R V	8.5 0.65	8.5 0.65	0
	Q6 2SC373	R V	5.4 4.5	6.0 0.65	6.3 8.6
	Q7 2SC373	R V	5.4 4.5	3.8 5.2	14.5 11.7
	Q8 2SA562	R V	14.5 13.3	14.5 12.5	0 13.2
X54-0002-00	Q1 2SC733		0.55	1.10	8.9
	Q2 2SC734		0.68	1.33	6.3
	Q3 2SC735		7.0	7.6	14.5
	Q4 2SA562		7.0	6.3	0
X43-0010-00	Q1 2SA606		14.5	13.8	9.0
	Q2 2SC372		5.3	5.9	13.8
	Q3 2SC372		5.5	5.7	5.9
	Q4 2SC372		5.5	6.15	9.0

B

Pin	Note 1	Q4 TA7045M	V1 12BY7A	V1 S2001	V2 S2001
1	R S	6.8 Note3/1.7	0 2.6	0 1.1	0 1.1
2	R S		−46 0	(6.3)	(6.3)
3	R S	0	0	235 215	235 215
4	R S		0	0 1.1	0 1.1
5	R S	6.8 Note3/1.7	0	−94 −50	−94 −50

Pin	Note 1	Q4 TA7045M	V1 12BY7A	V1 S2001	V2 S2001
6	R S	14.5 13.5	(6.3)	0 1.1	0 1.1
7	R S	0 13.5	318 290	0	0
8	R S	14.5 13.5	200 150	0	0
9	R S		0		
P	R S			910 815	910 815

● TABLE OF VOLTAGE

Unit No.	Terminal	Note1	Voltage
X52-0009-00	AF5	Note4	1.4
	AF6	Note5	0.4
	CAR		[1.0]
	MG	R S	−7.0 0
	B1	R S	14.5 13.5
	B2	R S	0 13.5
	SM		0
	ALC	R S	6.2 Note3 1.5
	BS		9.0
	VFO		[1.0]
	OUT	R S	[0] Note6 [0.5]
X50-0002-00	BS		9.0
	LSB		−0.4
	USB		−0.7
	CWT	R S	14.5 13.5
	OUT		[1.0]
X40-0016-00	R		5.4
	B		9.0
	OUT		[1.0]
X47-0004-00	14	R S	14.5 13.5
	9		9.0
	AS	SEP TRCV	3.0 0

Unit No.	Terminal	Note1	Voltage
X47-0004-00	OS	SEP TRCV	0 0.17
	MG	R S	−7.1 0
	OX	SEP TRCV	1.25 0.5
	OL		7.5
	MD	R S	14.5 13.5
	MVC	Note7	14.5
	DG	R S	−46.0 0
	H		(6.3)
	DP	R	318
	300	R S	318 290
	DVC	Note7	330
X53-0001-00	MG	R S	−7.0 0
	DG	R S	−46.0 0
	RS	R S	0 −94
	KEY	R C	0 −60
	−C		−94
	PG	R S	−94 −50
	ALC	R S	6.2 Note3 2.1

Unit No.	Terminal	Note1	Voltage
X53-0001-00	VR	R S	−37 −20
X54-0002-00	SS	R V	14.8 12.0
	RL	R V	0 13.2
	9V		9.0
	TV	Note8	8.5
	TB	R V	8.5 0.65
	TO	R V	8.5 0.65
	VS	R V	3.8 5.2
	14	R V	14.8 14.0
X54-0002-00	KY1	K C	13.6 12.8
	KY2	K C	−60 0
	OE	K Note9	0 1.6
	B	K C	14.5 13.5
X43-0010-00	IN	R S	14.5 13.5
	OUT		9.0
	RTI		5.4

Unit No.	Terminal	Note1	Voltage
X43-0011-00	HV	R S	(338) (310)
	850	R S	910 815
	300	R S	315 290
	C25	R S	335 315
	210	R S	235 215
	C26	R S	242 228
	−C	R S	−94 −97
	C28	R S	−102 −100
	14	R S	14.8 14.0
	14B	R S	(6.8) (6.6)
	14A	R S	(5.7) (5.5)
	100	R S	(75) (72)
	230	R S	(187) (178)
	320	R S	(260) (255)

Note 1: R: Under stand-by condition.
S: Under maximum CW transmitting output.
SEP: SEP ◀ ▶ TRCV switch at SEP Position.
TRCV: SEP ◀ ▶ TRCV switch at TRCV Position.
A: 0.5 V ANTI-VOX input Signal.
V: VOX and CW side tone operations.
K: CW operation with Stand-by Key inserted.
C: CW operation with Key downed.

Note2: Read E, B and C as S, G1 and G2 respectively, D is same as 14V Supply line.

Note 3: Approx. 5.5V if meter set at ALC range does not deflect.

Note 4: MODE switch set at AM. 0 at position other than AM.

Note 5: MODE switch set at position TUN, CW and AM.
0 at position other than TUN, CW and AM.

Note 6: Value raries depending on how ALC circuit funcitons.

Note 7: 3.5 MHz band. 0 for the band other than 3.5 MHz band.

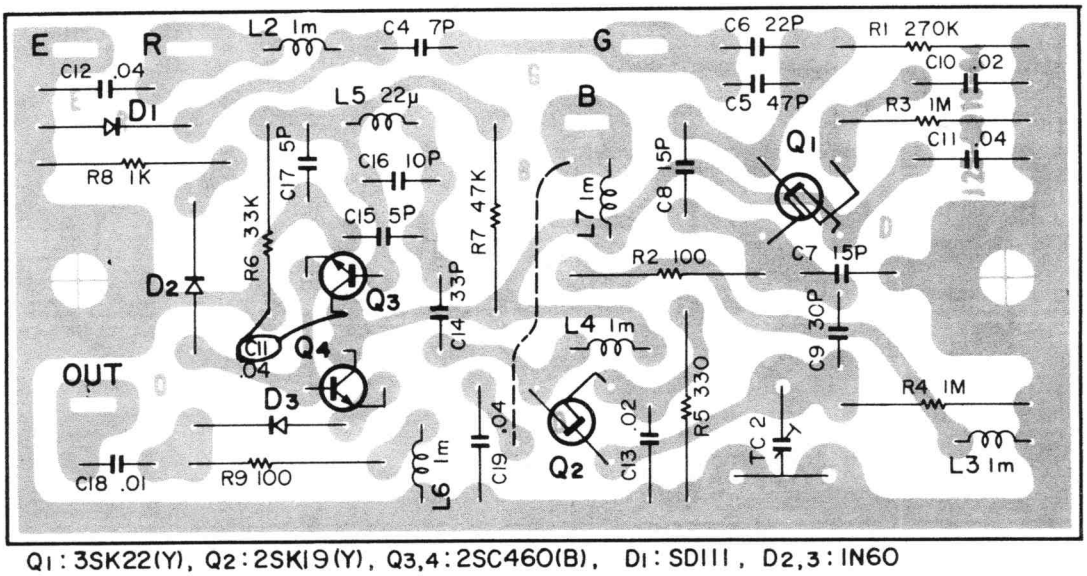
Note 8: DELAY VR control placed in the extreme counterclockwise position.

Note 9: Operations other than CW operation.

* Measurement is made using a vacuume tube voltmeter. The value Shows the voltage to the chassis. The value in ( ) denotes the AC voltage and that in [ ] the RF voltage.

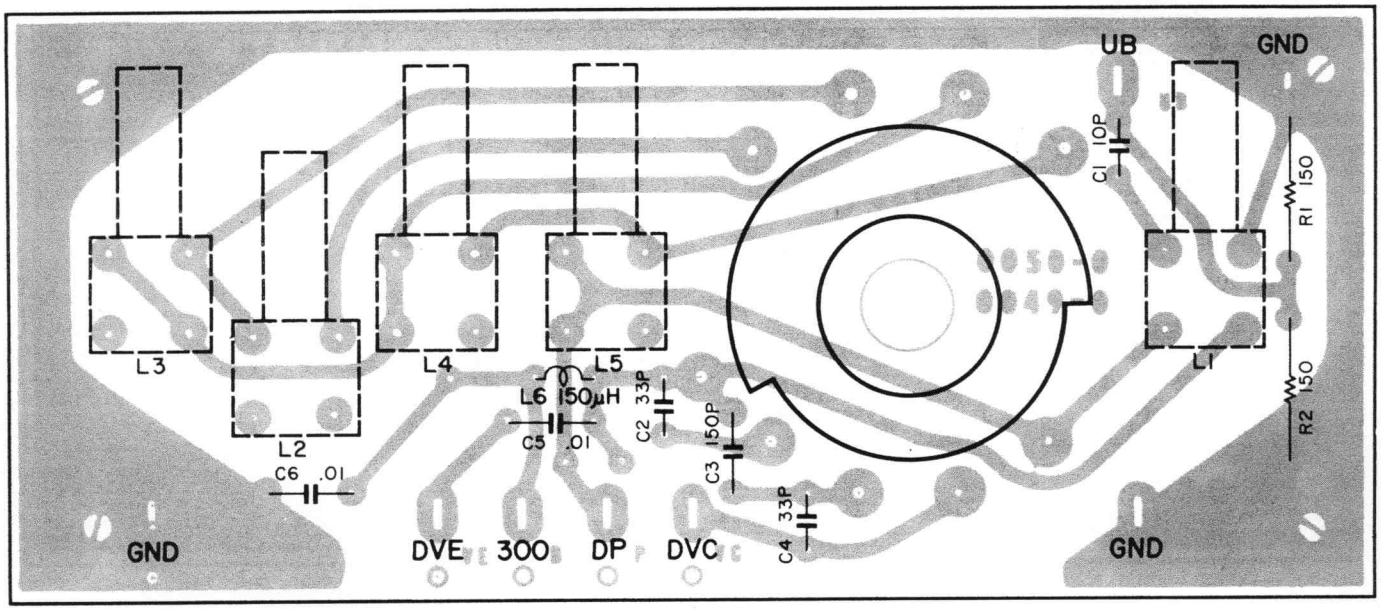
● PC BOARD

● X40-0016-00 ●



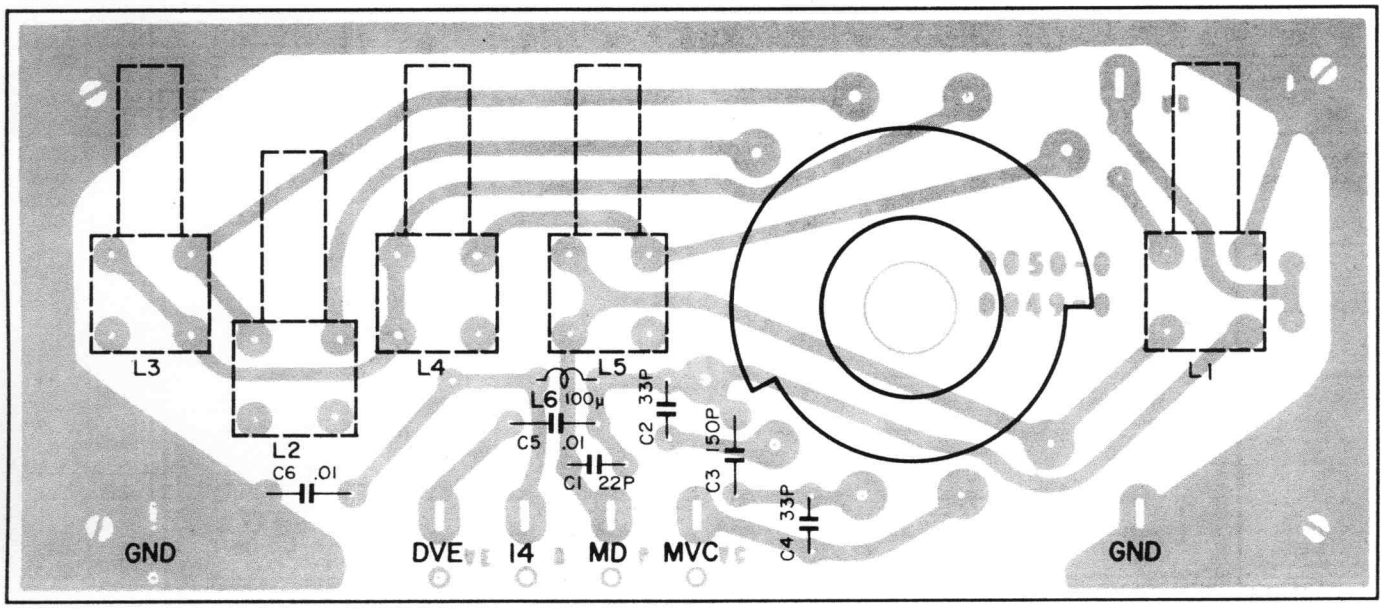
Q1 : 3SK22(Y), Q2 : 2SK19(Y), Q3,4 : 2SC460(B), D1 : SD111, D2,3 : IN60

● X40-0017-00 ●

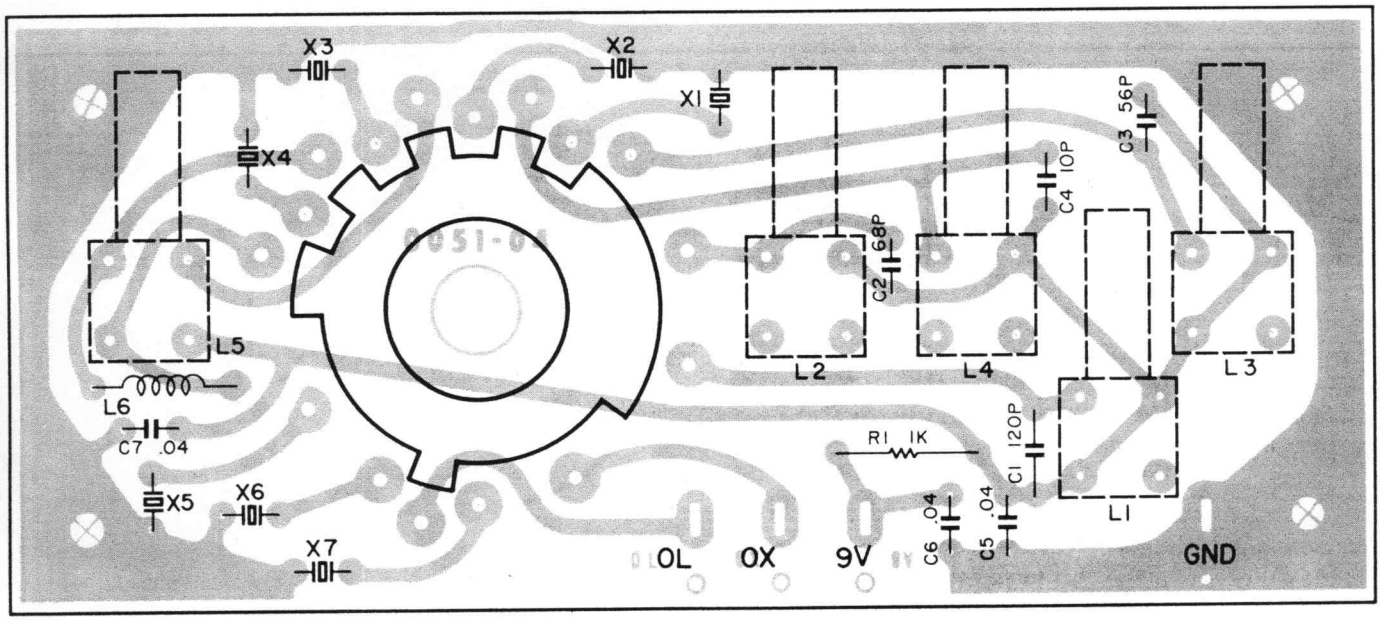


● PC BOARD

● X40-0018-00 ●

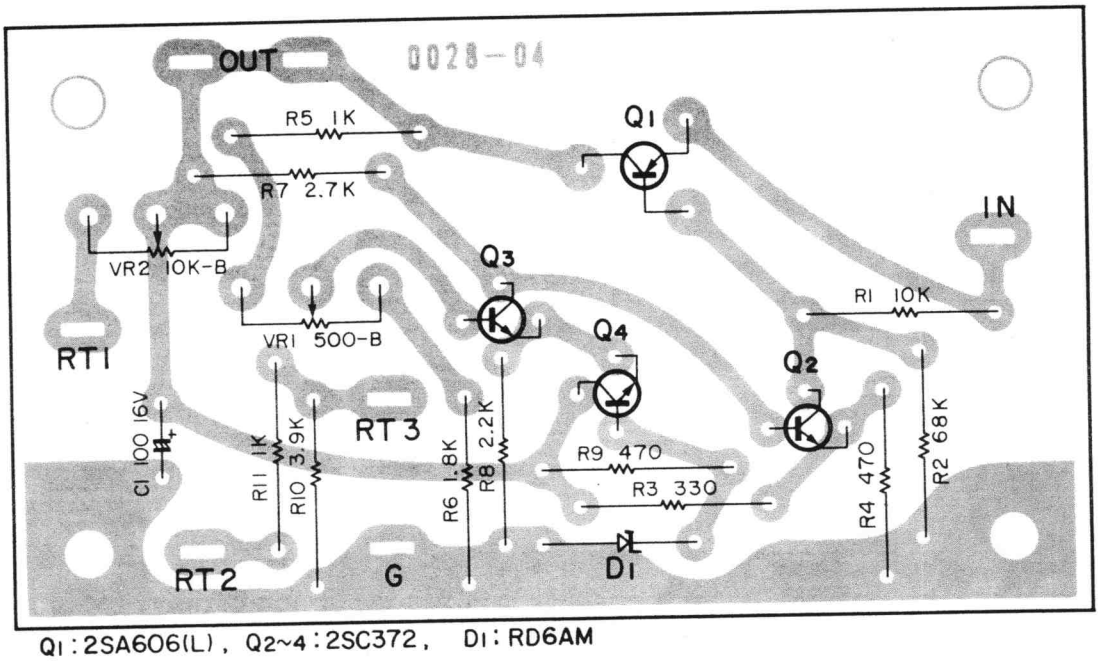


● X40-0019-00 ●



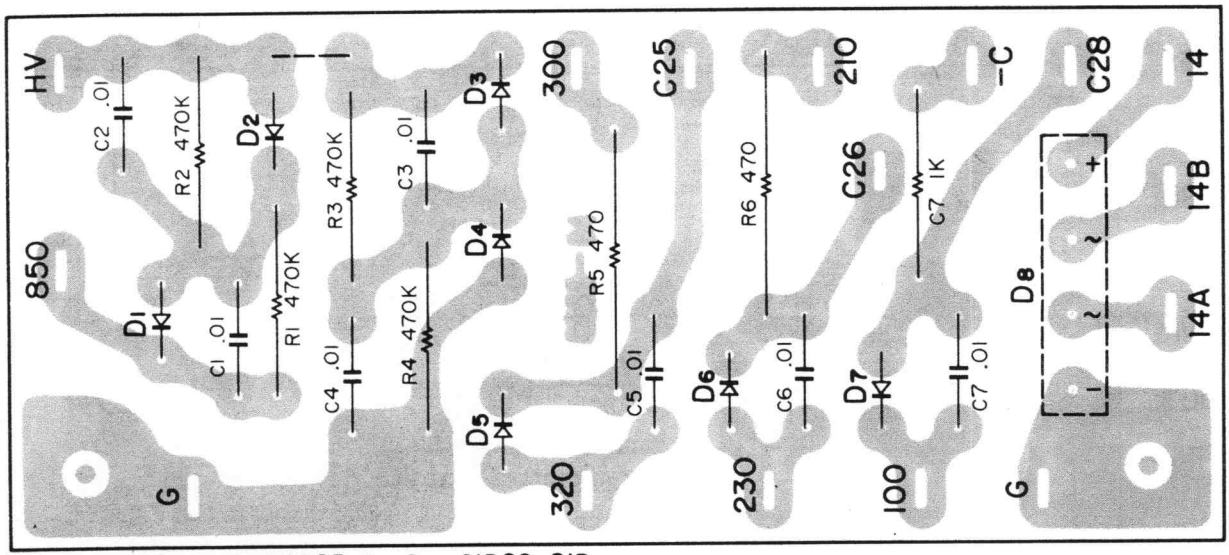
● PC BOARD

● X43-0010-00 ●



Q1 : 2SA606(L), Q2~4 : 2SC372, D1 : RD6AM

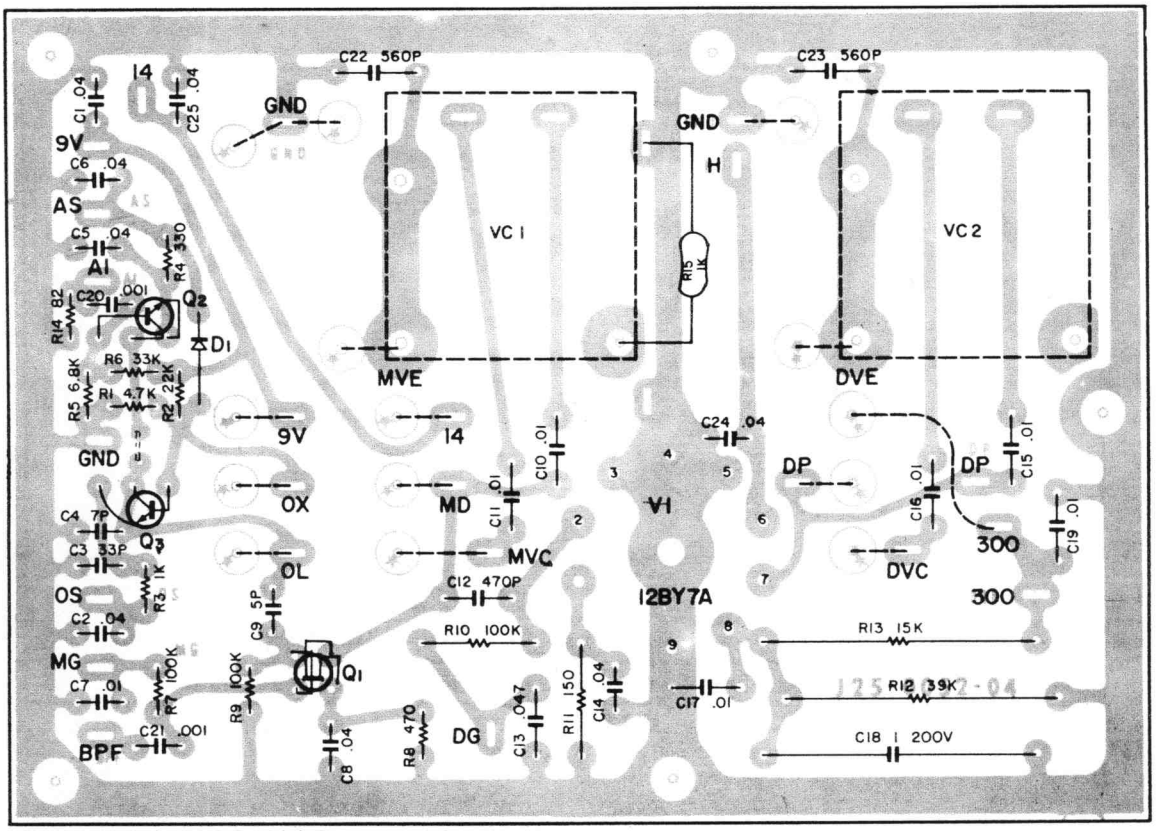
● X43-0011-00 ●



D1~6 : SE05-C, D7 : SE05-A, D8 : SIB02-01B

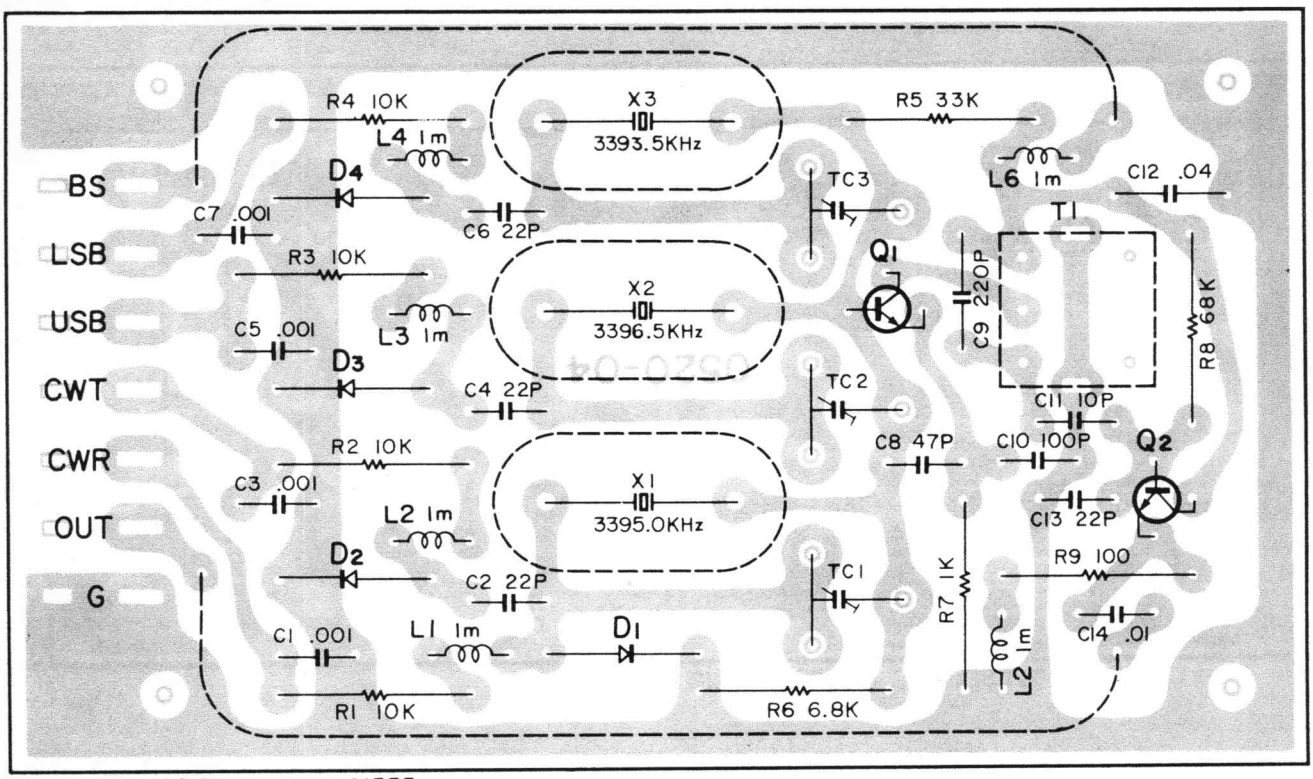
● PC BOARD

● X47-0004-00 ●



Q1 : 3SK22 (GR), Q2 : 2SC460 (B), Q3 : 2SC535 (A), D1 : 1S1555

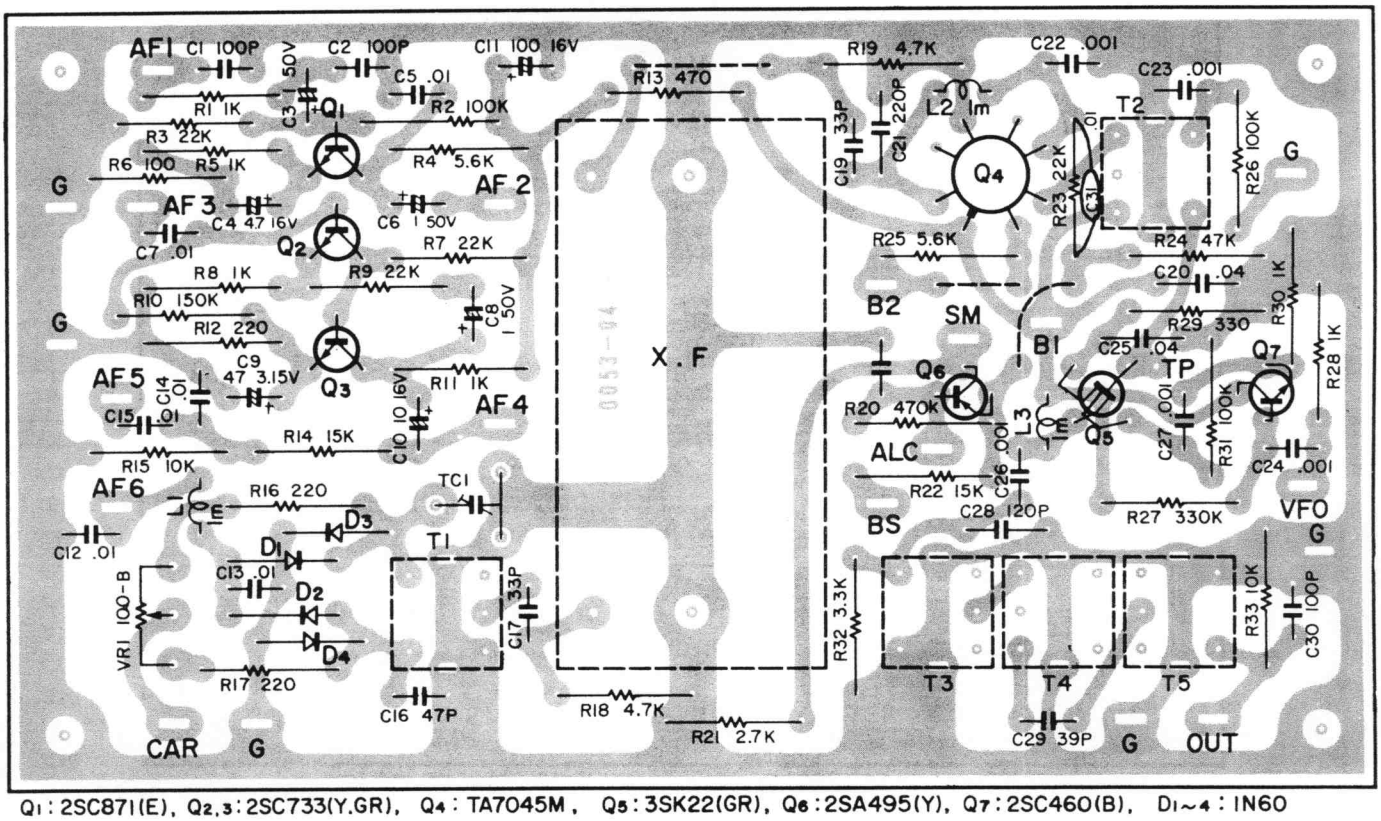
● X50-0002-00 ●



Q1,2 : 2SC460(B), D1~4 : 1S1555

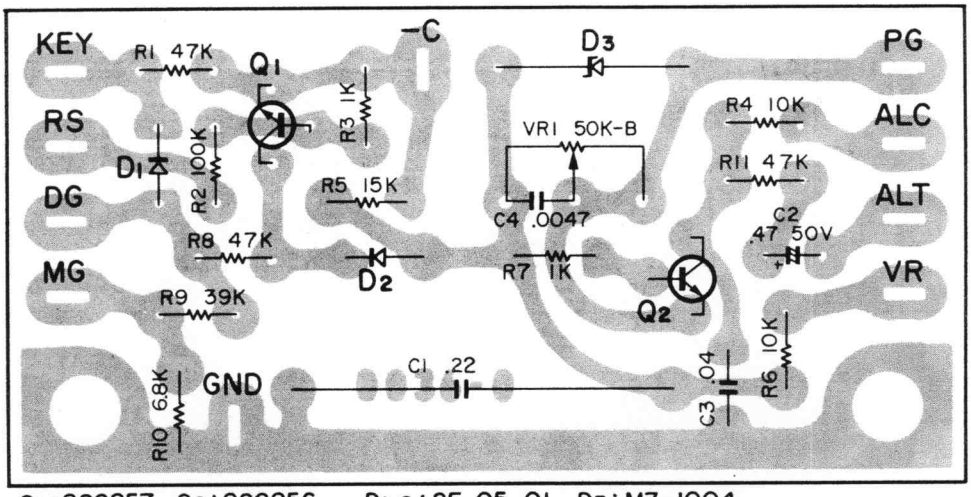
● PC BOARD

● X52-0009-00 ●



Q1 : 2SC871(E), Q2,3 : 2SC733(Y.GR), Q4 : TA7045M, Q5 : 3SK22(GR), Q6 : 2SA495(Y), Q7 : 2SC460(B), D1~4 : 1N60

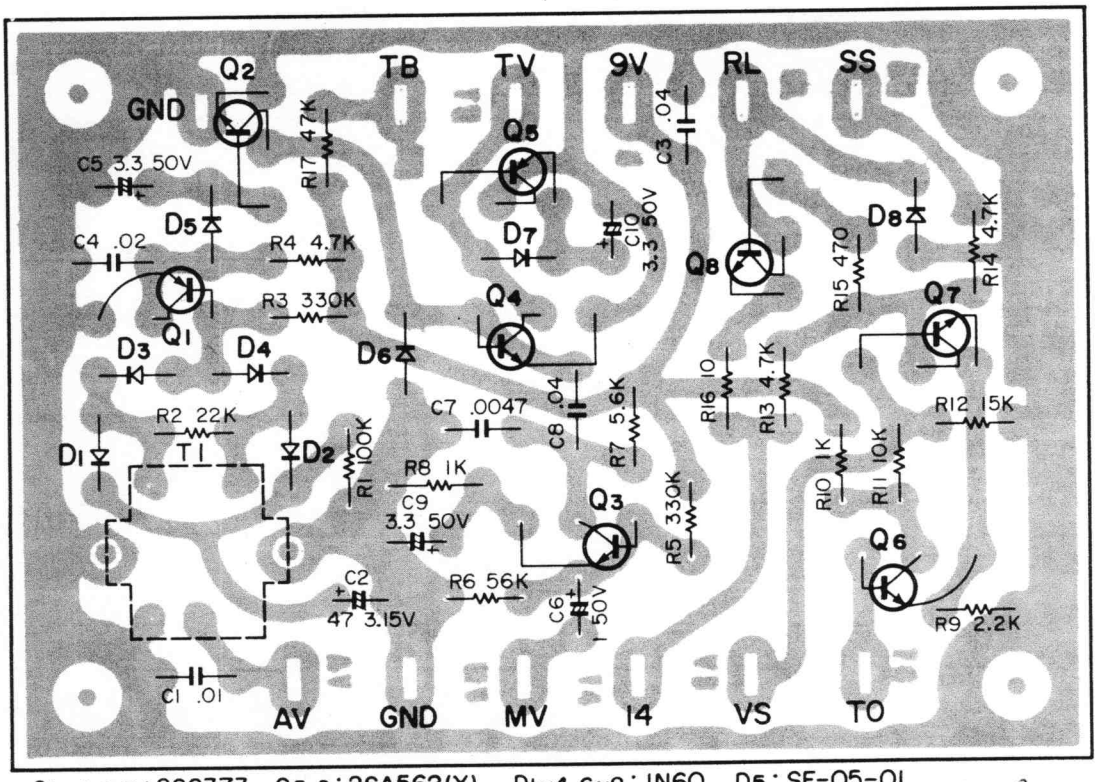
● X53-0001-00 ●



Q1 : 2SC857, Q2 : 2SC856, D1,2 : SE-05-01, D3 : MZ-1004

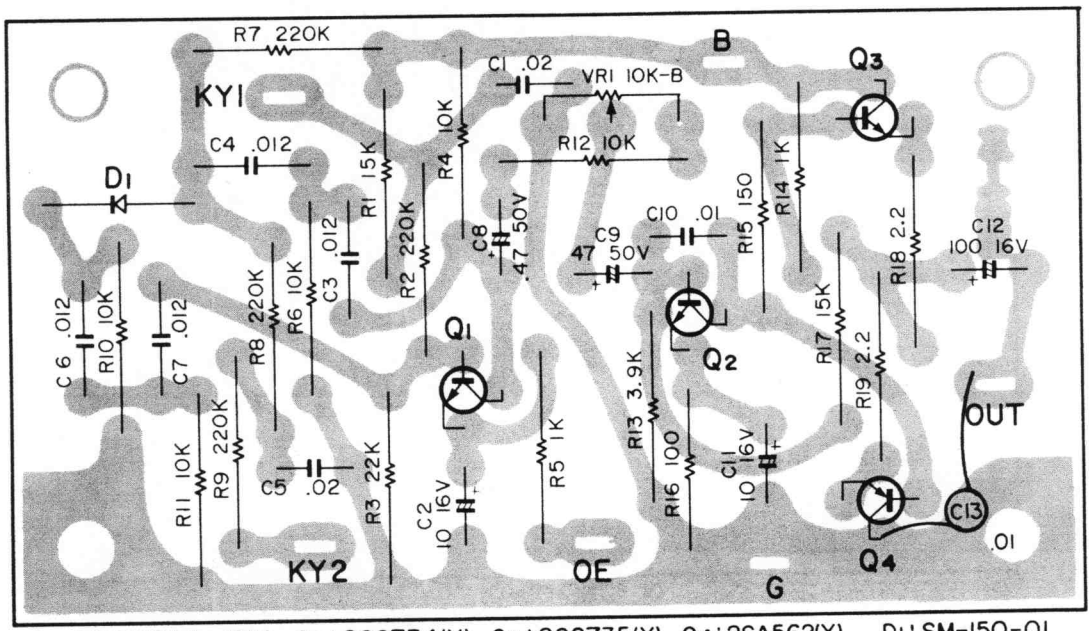
● PC BOARD

● X54-0001-00 ●



Q1~4,6,7 : 2SC373, Q5,8 : 2SA562(Y) D1~4,6~8 : IN60, D5 : SE-05-01

● X54-0002-00 ●



Q1 : 2SC733(Y)or(GR), Q2 : 2SC734(Y), Q3 : 2SC735(Y), Q4 : 2SA562(Y), D1 : SM-150-01

● PARTS LIST

Circuit No.	Description				Part No.	Remarks
MAIN CHASSIS (Y52-0011-05) SECTION						
PC BOARD						
	Generator unit				X52-0009-00	
	Carrier unit				X50-0002-00	
	VFO unit				X40-0016-00	
	Driver unit				X47-0004-00	
	OSC coil pack unit				X40-0019-00	
	MIX coil pack unit				X40-0018-00	
	Driver coil pack unit				X40-0017-00	
	Control unit				X53-0001-00	
	VOX unit				X54-0001-00	
	Side tone unit				X54-0002-00	
	AVR unit				X43-0010-00	
	Rectifier unit				X43-0011-00	
CAPACITOR						
C1	Mica	100pF	±5%		CM93F2H101J	
C2	Hi-K ceramic	0.001μF	+100%	−0%	CK94YZ2H102P	
C3, 4	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C7, 8	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C9	Hi-K ceramic	0.01μF	+100%	−0%	CK94YZ2H103P	
C11	Hi-K ceramic	0.001μF	±10%		C90-0009-05	
C13, 14	Hi-K ceramic	4700pF	+100%	−0%	C90-0017-05	
C15	Mica	150pF	±5%		CM93F2H151J (DM)	
C16	Mica	820pF	±5%		CM93F2H821J (DM)	
C17	Hi-K ceramic	0.01μF	+100%	−0%	CK94YZ2H103P	
C19	Hi-K ceramic	0.01μF	+100%	−0%	CK94YZ2H103P	
C20, 21	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C22	Hi-K ceramic	0.01μF	+100%	−0%	CK94YZ2H103P	
C23, 24	Electrolytic block	100μF	500WV		CE62AD2H101	
C25, 26	Electrolytic block	22μF	350WV		C90-0007-05	
C27, 28	Electrolytic tubular	33μF	160WV		CE02D2C330	
C29	Electrolytic tubular	1000μF	25WV		C90-0008-05	
C30, 31	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C32～35	Hi-K ceramic	0.0047μF	+100%	−0%	C90-0017-05	
C36, 37	PC electrolytic	10μF	25WV		CE04W1E100	
C38	Hi-K ceramic	0.01μF	+100%	−0%	CK94YZ2H103P	
C39	Mylar	0.1μF	±10%		CQ93M1H104K	
C41, 42	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	
C43, 44	Mica	33pF	±5%		CM93D1H330J(Z)	
RESISTOR						
R1	Insulated carbon film	39kΩ	±5%	1/4W	PD14BY2E393J	
R2	Insulated carbon film	680Ω	±5%	1/4W	PD14BY2E681J	
R3	Insulated carbon film	4.7kΩ	±5%	1/4W	PD14BY2E472J	
R4, 5	Carbon composition	10Ω	±5%	1W	RC05GF3A100J	
R6	Insulated carbon film	2.7kΩ	±5%	1/4W	PD14BY2E272J	
R7	Insulated carbon film	100kΩ	±5%	1/4W	PD14BY2E104J	
R8	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R9	Metal film	10kΩ	±5%	2W	RN14AB3D103J	
R10～12	Insulated carbon film	680kΩ	±5%	1/2W	PD14BY2H684J	
R13	Insulated carbon film	100kΩ	±5%	1/4W	PD14BY2E104J	
R14	Insulated carbon film	470kΩ	±5%	1/4W	PD14BY2E474J	
R15	Insulated carbon film	10kΩ	±5%	1/4W	PD14BY2E103J	
R16, 17	Carbon composition	470kΩ	±10%	1/2W	RC05GF2H474K	

● PARTS LIST

Circuit No.	Description				Part No.	Remarks
R18	Metal film	15kΩ	±5%	7.5W	R92-0050-05	
R19	Metal film	10kΩ	±5%	7.5W	R92-0049-05	
R21	Insulated carbon film	2.7kΩ	±5%	1/4W	PD14BY2E272J	
R22	Insulated carbon film	100Ω	±5%	1/4W	PD14BY2E101J	
R23	Insulated carbon film	10kΩ	±5%	1/4W	PD14BY2E103J	
R24	Insulated carbon film	220kΩ	±5%	1/4W	PD14BY2E224J	
	POTENTIOMETER					
VR1	MIC GAIN	10kΩ (A)			R01-3008-05	
VR2	CAR	5kΩ (B)			R01-2001-05	
VR3	AM SET	500kΩ (B) PC trimmer potentiometer			R12-7008-05	
VR4	RF LEVEL	10kΩ (B) PC trimmer potentiometer			R12-3011-05	
VR5	BIAS	50kΩ (B)			R01-4001-05	
VR6	ANTIBOX	300Ω (B)			R01-0001-05	
VR7	VOX GAIN	50kΩ (B)			R01-4001-05	
VR8	DELAY	250kΩ (B)			R01-6001-05	
	TUBE/DIODE					
V1, 2	S2001					
D1	1N60					
D2	SE-05A					
D3	1S388U					
D4	1N60					
	SWITCH					
S4	BAND (Rotary)				S10-1002-05	
S5	MIC (Slide)				S31-2002-05	
S6	MODE (Rotary)				S29-3002-05	
S7	FUNCTION (Rotary)				S29-2001-05	
S8	TRVTR (Slide)				S31-2007-05	
S9	METER (Rotary)				S29-1006-05	
S10	TRCV (Slide)				S31-4001-05	
S11	STBY (Toggle)				S43-1002-05	
S12	AC SELECT (Seesaw)				S36-2003-15	
S13	POWER (Toggle)				S43-1001-05	
	COIL/TRANS./CHOKE					
L1, 2	Ferri-inductor				L33-0098-05	
L3	Choke coil				L33-0048-04	
L4	Output coil (B)				L31-0038-05	
L5	Output coil (A)				L31-0142-03	
L6, 7	Ferri-inductor				L33-0098-05	
L8	Choke coil				L33-0032-05	
L9, 10	Line filter coil				L33-0029-04	
L11	Parasitic coil				L33-0010-05	
L12, 13	Parasitic coil				L39-0030-04	
L14, 15	Ferri-inductor				L33-0104-05	
L16	Filter coil (A)				L36-0198-05	
L17	Filter coil (B)				L31-0199-05	
L18	Filter coil (A)				L36-0198-05	
P.T.	Power transformer				L01-0009-05	
CH	Filter choke				L15-0002-15	
	MISCELLANEOUS					
–	Case				A01-0010-02	
–	Main chassis				A10-0022-02	
–	RF chassis				A11-0004-02	
–	Panel				A20-0048-03	

● PARTS LIST

Circuit No.	Description	Part No.	Remarks
–	Sub chassis	A22-0014-03	
–	Rear panel	A23-0029-13	
–	Bottom plate	A40-0004-02	
–	Dial escutcheon	B07-0005-13	
–	Jewel	B07-0007-14	
–	Acryl board (A)	B19-0007-14	
–	Acryl board (B)	B19-0011-04	
–	Acryl dial board	B19-0015-04	
–	Dial calibration	B20-0021-24	
P.L	Pilot lamp	B30-0015-15	
M	Meter	B31-0005-15	
–	Model badge	B40-0050-04	
–	Serial number name plate	B40-0332-14	
–	"PASSED" sticker	B42-0009-04	
–	Sticker (Bottom)	B42-0032-04	
–	Sticker (VR)	B42-0038-04	
–	Caution sticker	B42-0217-04	
–	Instruction manual	B50-0076-00	
–	Caution card	B58-0003-00	
–	Caution card	B58-0101-00	
VC1	Variable capacitor	C01-0004-05	
VC2	Variable capacitor	C01-0084-05	
TC1	Variable capacitor	C03-0002-05	
–	Pulley	D15-0013-14	
–	Drive shaft	D21-0026-04	
–	Final shaft	D21-0029-04	
–	Final pipe shaft	D21-0028-04	
–	Rotary switch shaft	D21-0031-05	
–	Bearing	D23-0048-04	
–	Bearing	D23-0061-04	
–	Stopper	D32-0018-04	
–	US socket	E01-0801-05	
–	Receptacle (Jack)	E04-0115-05	
–	4P concent (Jack)	E06-0403-05	
–	4P concent (Plug)	E07-0403-05	
–	AC outlet	E08-0207-05	
–	16P connector (Socket)	E08-1601-05	
–	2P concent (Jack)	E08-0204-05	
–	2P concent (Plug)	E09-0204-05	
–	16P connector (Plug)	E09-1601-05	
–	Phone jack (KEY)	E11-0005-05	
–	1P pin jack	E13-0101-05	
–	1 pin plug	E14-0101-05	
–	Relay socket	E18-1602-05	
–	Power cord	E30-0046-05	
–	Plate cap	E90-0004-05	
F	Fuse	F05-6021-05	
–	Line filter cover	F07-0178-04	
–	Final cover	F07-0007-03	
–	Shield plate for rotary	F10-0026-04	
–	Shield plate for drive	F10-0027-04	
–	Shield plate for coil pack	F10-0028-04	
–	Shield plate for relay	F10-0029-04	
–	Shield plate for drive	F10-0052-04	
–	Final shield case	F11-0022-03	
–	Spring	G01-0023-24	

● PARTS LIST

Circuit No.	Description	Part No.	Remarks
–	Carton case	H01-0078-13	
–	Carton case	H03-0035-03	
–	Sub legs	J02-0005-04	
–	Legs	J02-0010-04	
–	Relay shield case	J10-0029-04	
–	Pilot lamp holder	J13-0002-05	
–	Fuse holder	J13-0007-05	
–	Switch stopper	J19-0038-04	
–	VFO holder	J20-0008-04	
–	Variable resistor stopper	J20-0013-14	
–	Meter stopper	J20-0014-04	
–	PC stopper	J21-0047-04	
–	VOX holder	J21-0066-04	
–	AVR holder (A)	J21-0067-04	
–	AVR holder (B)	J21-0068-04	
–	VC holder	J21-0070-04	
–	Switch holder	J21-0072-04	
–	Line filter holder	J21-0711-04	
–	Fan stopper	J25-0712-14	
–	PC board	J25-0498-04	
–	Solenoid	J59-0002-05	
–	Knob (MAIN TUNING DIAL)	K20-0007-04	
–	Knob (MODE, METER, FUNCTION, DRIVE)	K20-0008-14	
–	Knob (LOAD)	K20-0011-14	
–	Knob (BAND)	K20-0012-04	
–	Knob (PLATE)	K20-0016-14	
–	Knob assembly	K20-0101-04	
R.L.	Relay	S51-4003-05	
M	Fan motor	T40-0001-05	

● X52-0009-00 ●

CAPACITOR						
C1, 2	Temperature compensating ceramic	100pF	±10%		CC94SL1H101K	
C3	PC electrolytic	1μF	50WV		CE04W1H010	
C4	PC electrolytic	4.7μF	16WV		CE04W1C4R7	
C5	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	
C6	PC electrolytic	1μF	50WV		CE04W1H010	
C7	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	
C8	PC electrolytic	1μF	50WV		CE04W1H010	
C9	PC electrolytic	47μF	3.15WV		CE04W0F470	
C10	PC electrolytic	10μF	16WV		CE04W1C100	
C11	PC electrolytic	100μF	16WV		CE04W1C101	
C12～15	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	
C16	Mica	47pF	±5%		CM93D2H470JZ	
C17	Mica	33pF	±5%		CM93D2H330JZ	
C19	Mica	33pF	±5%		CM93D2H330JZ	
C20	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C21	Mica	220pF	±5%		CM93D2H221JZ	
C22～24	Hi-K ceramic	0.001μF	+80%	−20%	CK94YG1E102Z	
C25	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C26, 27	Hi-K ceramic	0.001μF	+80%	−20%	CK94YG1E102Z	
C28	Mica	120pF	±5%		CM93D2H121JZ	
C29	Mica	39pF	±5%		CM93D2H390JZ	
C30	Mica	100pF	±5%		CM93D2H101JZ	
C31	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	

● PARTS LIST

Circuit No.	Description				Part No.	Remarks
	RESISTOR					
R1	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R2	Insulated carbon film	100kΩ	±5%	1/4W	PD14BY2E104J	
R3	Insulated carbon film	22kΩ	±5%	1/4W	PD14BY2E223J	
R4	Insulated carbon film	5.6kΩ	±5%	1/4W	PD14BY2E562J	
R5	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R6	Insulated carbon film	100Ω	±5%	1/4W	PD14BY2E101J	
R7	Insulated carbon film	22kΩ	±5%	1/4W	PD14BY2E223J	
R8	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R9	Insulated carbon film	22kΩ	±5%	1/4W	PD14BY2E223J	
R10	Insulated carbon film	150kΩ	±5%	1/4W	PD14BY2E154J	
R11	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R12	Insulated carbon film	220Ω	±5%	1/4W	PD14BY2E221J	
R13	Insulated carbon film	470Ω	±5%	1/4W	PD14BY2E471J	
R14	Insulated carbon film	15kΩ	±5%	1/4W	PD14BY2E153J	
R15	Insulated carbon film	10kΩ	±5%	1/4W	PD14BY2E103J	
R16, 17	Insulated carbon film	220Ω	±5%	1/4W	PD14BY2E221J	
R18, 19	Insulated carbon film	4.7kΩ	±5%	1/4W	PD14BY2E472J	
R20	Insulated carbon film	470kΩ	±5%	1/4W	PD14BY2E474J	
R21	Insulated cabron film	2.7kΩ	±5%	1/4W	PD14BY2E272J	
R22	Insulated carbon film	15kΩ	±5%	1/4W	PD14BY2E153J	
R23	Insulated carbon film	22kΩ	±5%	1/4W	PD14BY2E223J	
R24	Insulated carbon film	47kΩ	±5%	1/4W	PD14BY2E473J	
R25	Insulated carbon film	5.6kΩ	±5%	1/4W	PD14BY2E562J	
R26	Insulated carbon film	100kΩ	±5%	1/4W	PD14BY2E104J	
R27	Insulated carbon film	330kΩ	±5%	1/4W	PD14BY2E334J	
R28	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R29	Insulated carbon film	330Ω	±5%	1/4W	PD14BY2E331J	
R30	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R31	Insulated carbon film	100kΩ	±5%	1/4W	PD14BY2E104J	
R32	Insulated carbon film	3.3kΩ	±5%	1/4W	PD14BY2E332J	
R33	Insulated carbon film	10kΩ	±5%	1/4W	PD14BY2E103J	
	TRANSISTOR/IC/FET					
Q1	2SC871 (E)					
Q2, 3	2SC733 (Y) or (GR)					
Q4	TA7045M (Red)					
Q5	3SK22 (GR)					
Q6	2SA495 (Y)					
Q7	2SC460 (B)					
D1 ~ 4	1N60					
	IF Trans.					
T1	IF trans.				L30-0021-05	
T2	IF trans.				L30-0012-05	
T3	IF trans. (BPF)				L30-0008-05	
T4	IF trans.				L30-0009-05	
T5	IF trans. (BPF)				L30-0008-05	
	MISCELLANEOUS					
XF	Crystal filter				L71-0004-05	
L1 ~ 3	Ferri-inductor				L33-0104-05	
VR1	PC trimmer potentiometer 100Ω (B)				R12-0030-05	
TC1	Ceramic trimmer				C05-0015-05	
—	PC board				J25-0053-04	

● PARTS LIST

● X50-0002-00 ●

Circuit No.	Description				Part No.	Remarks
	CAPACITOR					
C1	Hi-K ceramic	0.001μF	+80%	−20%	CK94YG1E102Z	
C2	Mica	22pF	±5%		CM93D2H220JZ	
C3	Hi-K ceramic	0.001μF	+80%	−20%	CK94YG1E102Z	
C4	Mica	22pF	±5%		CM93M2H220JZ	
C5	Hi-K ceramic	0.001μF	+80%	−20%	CK94YG1E102Z	
C6	Mica	22pF	±5%		CM93D2H220JZ	
C7	Hi-K ceramic	0.001μF	+80%	−20%	CK94YG1E102Z	
C8	Hi-K ceramic	470pF	±10%		CK94YX1H471K	
C9	Temperature compensating ceramic	220pF	±5%		CC94TH1H221J	
C10	Temperature compensating ceramic	100pF	±10%		CC94SL1H101K	
C11	Mica	10pF	±5%		CM93D2H100JZ	
C12	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C13	Mica	22pF	±5%		CM93D2H220JZ	
C14	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	
	RESISTOR					
R1 ~ 4	Insulated carbon film	10kΩ	±5%		PD14BY2E103J	
R5	Insulated carbon film	33kΩ	±5%		PD14BY2E333J	
R6	Insulated carbon film	6.8kΩ	±5%		PD14BY2E682J	
R7	Insulated carbon film	1kΩ	±5%		PD14BY2E102J	
R8	Insulated carbon film	68kΩ	±5%		PD14BY2E683J	
R9	Insulated carbon film	100Ω	±5%		PD14BY2E101J	
	CRYSTAL OSCILLATOR/COIL					
X1	Crystal oscillator (3395.0kHz)				L77-0123-05	
X2	Crystal oscillator (3396.5kHz)				L77-0122-05	
X3	Crystal oscillator (3393.5kHz)				L77-0120-05	
T1	Oscillator coil				L32-0003-05	
L1 ~ 6	Ferri-inductor				L33-0104-05	
	TRANSISTOR/DIODE					
Q1, 2	2SC460 (B)					
D1 ~ 4	1S1555					
Tc1 ~ 3	Ceramic trimmer				C05-0013-05	
	MISCELLANEOUS					
–	Shield plate				F10-0012-04	
–	Shield box				F11-0015-04	
–	PC board				J25-0029-04	

● X40-0016-00 ●

	CAPACITOR					
C1	Temperature compensating ceramic	47pF	±5%		CC94PG1H470J	
C2, 3	Temperature compensating ceramic	15pF	±5%		CC94LG1H150J	
C4	Temperature compensating ceramic	7pF	±5%		CC94SG1H070J	
C5	Temperature compensating ceramic	47pF	±5%		CC94LG1H470J	
C6	Temperature compensating ceramic	22pF	±5%		CC94LG1H220J	
C7, 8	Mica	150pF	±5%		CM93D2A151J (DM)	
C9	Mica	3pF	±0.25pF		CM93D1H030J (Z)	
C10	Hi-K ceramic	0.02μF	+80%	−20%	CK94YG1E203Z	
C11, 12	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C13	Hi-K ceramic	0.02μF	+80%	−20%	CK94YG1E203Z	

● PARTS LIST

Circuit No.	Description				Part No.	Remarks
C14	Temperature compensating ceramic	33pF	±0.5%		CC94SL1H330D	
C15	Temperature compensating ceramic	5pF	±0.5%		CC94SL1H050D	
C16	Temperature compensating ceramic	10pF	±0.5%		CC94SL1H100D	
C17	Temperature compensating ceramic	5pF	±0.5%		CC94SL1H050D	
C18	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	
C19	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C20	Temperature compensating ceramic	10pF	±5%		CC94CG1H100J	
	RESISTOR					
R1	Insulated carbon film	270kΩ	±5%	1/4W	PD14BY2E274J	
R2	Insulated carbon film	100Ω	±5%	1/4W	PD14BY2E101J	
R3, 4	Insulated carbon film	1MΩ	±5%	1/4W	PD14BY2E105J	
R5	Insulated carbon film	330Ω	±5%	1/4W	PD14BY2E331J	
R6	Insulated carbon film	33kΩ	±5%	1/4W	PD14BY2E333J	
R7	Insulated carbon film	47kΩ	±5%	1/4W	PD14BY2E473J	
R8	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R9	Insulated carbon film	100Ω	±5%	1/4W	PD14BY2E101J	
	TRANSISTOR/DIODE					
Q1	3SK22 (Y)					
Q2	2SK19 (Y)					
Q3, 4	2SC460 (B)					
D1	SD111					
D2, 3	1N60					
	COIL					
L1	Oscillator coil				L32-0098-04	
L2～4	Ferri-inductor				L33-0104-05	
L5	Ferri-inductor				L33-0091-05	
L6, 7	Ferri-inductor				L33-0104-05	
	VFO BOX					
–	VFO BOX (A)				F11-0004-23	
–	VFO BOX (B)				F11-0005-04	
–	VFO BOX (C)				F11-0121-14	
–	VFO BOX (D)				F11-0007-14	
–	VFO BOX (E)				F11-0008-04	
–	VFO BOX (F)				F11-0009-04	
–	VFO BOX (G)				F11-0010-04	
–	VFO BOX (H)				F11-0011-04	
–	VFO BOX (I)				F11-0012-04	
	MISCELLANEOUS					
VC	Variable capacitor				C01-0001-05	
TC1	Midget variable capacitor				C03-0001-05	
TC2	Trimmer				C05-0013-05	
–	Dial mechanism				D40-0007-05	
–	PC board				J25-0019-04	

● X47-0004-00 ●

	CAPACITOR					
C1, 2	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C3	Mica	33pF	±5%		CM93D2H330J (Z)	
C4	Mica	7pF	±5%		CM93D2H070J (Z)	
C5, 6	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C7	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	

● PARTS LIST

Circuit No.	Description				Part No.	Remarks
C8	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C9	Mica	5pF	±5%		CM93D2H050J (Z)	
C10, 11	Hi-K ceramic	0.01μF	±20%		CK94YY2H103M	
C12	Mica	470pF	+80%	−20%	CM93D2H471J (Z)	
C13	Hi-K ceramic	0.0047μF	±20%		CK94YY2H472M	
C14	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
C15～17	Hi-K ceramic	0.01μF	±20%		CK94YY2H103M	
C18	Electrolytic tubular	1μF	450WV		CE02D2W010	
C19	Hi-K ceramic	0.01μF	±20%		CK94YY2H103M	
C20, 21	Hi-K ceramic	0.001μF	±20%		CK94YY2H102M	
C22, 23	Mica	560pF	±5%		CM93D2H561J (DM)	
C24, 25	Hi-K ceramic	0.04μF	+80%	−20%	CK94YG1E403Z	
	RESISTOR					
R1	Insulated carbon film	4.7kΩ	±5%	1/4W	PD14CY2E472J	
R2	Insulated carbon film	22kΩ	±5%	1/4W	PD14CY2E223J	
R3	Insulated carbon film	1kΩ	±5%	1/4W	PD14CY2E102J	
R4	Insulated carbon film	330Ω	±5%	1/4W	PD14CY2E331J	
R5	Insulated carbon film	6.8kΩ	±5%	1/4W	PD14CY2E682J	
R6	Insulated carbon film	33kΩ	±5%	1/4W	PD14CY2E333J	
R7	Insulated carbon film	100kΩ	±5%	1/4W	PD14CY2E104J	
R8	Insulated carbon film	470Ω	±5%	1/4W	PD14CY2E471J	
R9	Insulated carbon film	100kΩ	±5%	1/4W	PD14CY2E104J	
R10	Insulated carbon film	100kΩ	±5%	1/4W	PD14BY2E104J	
R11	Insulated carbon film	150Ω	±5%	1/4W	PD14BY2E151J	
R12	Metal film	39kΩ	±5%	3W	RN14AB3F393J	
R13	Metal film	15kΩ	±5%	3W	RN14AB3F153J	
R14	Insulated carbon film	82Ω	±5%	1/4W	PD14CY2E820J	
R15	Insulated carobn film	1kΩ	±5%	1/4W	PD14BY2E102J	
	TUBE/TRANSISTOR/DIODE					
V1	12BY7A					
Q1	3SK22 (GR)					
Q2	2SC535 (A)					
Q3	2SC460 (B)					
D1	1S1555					
	MISCELLANEOUS					
VC	Variable capacitor				C01-0127-05	
–	Pulley				D15-0013-14	
–	PC sockets (7P, MT)				E10-1902-05	
–	Shield plate				F10-0022-04	
–	Tube shield				F11-0020-05	
–	PC board				J25-0052-04	

● X40-0019-00 ●

	CAPACITOR					
C1	Mica	120pF	±5%		CM93D2H121J (Z)	
C2	Mica	68pF	±5%		CM93D2H680J (Z)	
C3	Mica	56pF	±5%		CM93D2H560J (Z)	
C4	Mica	10pF	±5%		CM93D2H100J (Z)	
C5～7	Hi-K ceramic	0.04μF	+80%	−20%	CK93YG1E403Z	
	RESISTOR					
R1	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	

● PARTS LIST

Circuit No.	Description	Part No.	Remarks
	COIL		
L1	Oscillator coil (3.5MHz)	L31-0032-04	
L2	Oscillator coil (7MHz)	L31-0032-04	
L3	Oscillator coil (14MHz)	L31-0033-04	
L4	Oscillator coil (21MHz)	L32-0011-04	
L5	Oscillator coil (28MHz)	L32-0138-04	
L6	Oscillator coil (28MHz)	L32-0012-04	
	CRYSTAL OSCILLATOR		
X1	Crystal oscillator (12.395MHz)	L77-0141-05	
X2	Crystal oscillator (15.895MHz)	L77-0142-05	
X3	Crystal oscillator (22.895MHz)	L77-0143-05	
X4	Crystal oscillator (29.895MHz)	L77-0144-05	
X5	Crystal oscillator (36.895MHz)	L77-0145-05	
X6	Crystal oscillator (37.395MHz)	L77-0146-05	
X7	Crystal oscillator (37.995MHz)	L77-0147-05	
	MISCELLANEOUS		
–	PC board	J25-0051-04	
–	Wafer	S29-1005-05	

● X40-0018-00 ●

	CAPACITOR					
C1	Mica	22pF	±5%		CM93D2H220J (DM)	
C2	Mica	33pF	±5%		CM93D2H330J (DM)	
C3	Mica	150pF	±5%		CM93D2H151J (DM)	
C4	Mica	33pF	±5%		CM93D2H330J (DM)	
C5, 6	Hi-K ceramic	0.01μF	±20%		CK94YY2H103M	
	COIL					
L1	Tuning coil (3.5MHz)				L31-0036-04	
L2	Tuning coil (7MHz)				L31-0032-04	
L3	Tuning coil (14MHz)				L31-0033-04	
L4	Tuning coil (21MHz)				L31-0034-04	
L5	Tuning coil (28MHz)				L31-0209-04	
L6	Ferri-inductor				L33-0095-05	
	MISCELLANEOUS					
–	PC board				J25-0050-04	
–	Wafer				S29-1052-05	

● X40-0017-00 ●

	CAPACITOR					
C1	Mica	10pF	±5%		CM93D2H220J (Z)	
C2	Mica	33pF	±5%		CM93D2H330J (Z)	
C3	Mica	150pF	±5%		CM93D2H151J (Z)	
C4	Mica	33pF	±5%		CM93D2H330J (Z)	
C5, 6	Hi-K ceramic	0.01μF	±20%		CK94YY2H103M	
	RESISTOR					
R1, 2	Insulated carbon film	150Ω	±5%	1/4W	PD14BY2E151J	
	COIL					
L1	Tuning coil (3.5MHz)				L31-0031-04	

● PARTS LIST

Circuit No.	Description	Part No.	Remarks
L2	Tuning coil (7MHz)	L31-0032-04	
L3	Tuning coil (14MHz)	L31-0033-04	
L4	Tuning coil (21MHz)	L31-0034-04	
L5	Tuning coil (28MHz)	L31-0209-04	
L6	Ferri-inductor	L33-0097-05	
	MISCELLANEOUS		
–	PC board	J25-0049-04	
–	Wafer	S29-1052-05	

● X53-0001-00 ●

	CAPACITOR					
C1	Metalized paper	0.22μF	±20%		CH05S2E224M	
C2	PC electrolytic	0.47μF	50WV		CE04W1HR47	
C3	Hi-K ceramic	0.04μF	+80%	–20%	CK94YG1E403Z	
C4	Hi-K ceramic	0.0047μF	+80%	–20%	CK94YG1E472Z	
	RESISTOR					
R1	Insulated carbon film	47kΩ	±5%	1/4W	PD14CY2E473J	
R2	Insulated carbon film	100kΩ	±5%	1/4W	PD14CY2E104J	
R3	Insulated carbon film	1kΩ	±5%	1/4W	PD14CY2E102J	
R4	Insulated carbon film	10kΩ	±5%	1/4W	PD14CY2E103J	
R5	Insulated carbon film	15kΩ	±5%	1/4W	PD14CY2E153J	
R6	Insulated carbon film	10kΩ	±5%	1/4W	PD14CY2E103J	
R7	Insulated carbon film	1kΩ	±5%	1/4W	PD14CY2E102J	
R8	Insulated carbon film	47kΩ	±5%	1/4W	PD14CY2E473J	
R9	Insulated carbon film	39kΩ	±5%	1/4W	PD14CY2E393J	
R10	Insulated carbon film	6.8kΩ	±5%	1/4W	PD14CY2E682J	
R11	Insulated carbon film	47kΩ	±5%	1/4W	PD14CY2E473J	
	TRANSISTOR/DIODE					
Q1	2SC857					
Q2	2SC856					
D1, 2	SE05-01					
D3	MZ1004					
	MISCELLANEOUS					
VR1	PC trimmer potentiometer 50kΩ (B)				R12-4015-05	
–	PC board				J25-0036-04	

● X54-0001-00 ●

	CAPACITOR					
C1	Hi-K ceramic	0.01μF	+80%	–20%	CK94YG1E103Z	
C2	PC electrolytic	47μF	3.15WV		CE04W0F470	
C3	Hi-K ceramic	0.04μF	+80%	–20%	CK94YG1E403Z	
C4	Hi-K ceramic	0.02μF	+80%	–20%	CK94YG1E203Z	
C5	PC electrolytic	3.3μF	50WV		CE04W1H3R3	
C6	PC electrolytic	1μF	50WV		CE04W1H010	
C7	Hi-K ceramic	0.0047μF	±20%		CK94YY1M472M	
C8	Hi-K ceramic	0.04μF	+80%	–20%	CK94YG1E403Z	
C9, 10	PC electrolytic	3.3μF	50WV		CE04W1H3R3	
	RESISTOR					
R1	Insulated carbon film	100kΩ	±5%	1/4W	PD14CY2E104J	

● PARTS LIST

Circuit No.	Description				Part No.	Remarks
R2	Insulated carbon film	22kΩ	±5%	1/4W	PD14CY2E223J	
R3	Insulated carbon film	330kΩ	±5%	1/4W	PD14CY2E334J	
R4	Insulated carbon film	4.7kΩ	±5%	1/4W	PD14CY2E472J	
R5	Insulated carbon film	330kΩ	±5%	1/4W	PD14CY2E334J	
R6	Insulated carbon film	56kΩ	±5%	1/4W	PD14CY2E563J	
R7	Insulated carbon film	5.6kΩ	±5%	1/4W	PD14CY2E562J	
R8	Insulated carbon film	1kΩ	±5%	1/4W	PD14CY2E102J	
R9	Insulated carbon film	2.2kΩ	±5%	1/4W	PD14CY2E222J	
R10	Insulated carbon film	1kΩ	±5%	1/4W	PD14CY2E102J	
R11	Insulated carbon film	10kΩ	±5%	1/4W	PD14CY2E103J	
R12	Insulated carbon film	15kΩ	±5%	1/4W	PD14CY2E153J	
R13, 14	Insulated carbon film	4.7kΩ	±5%	1/4W	PD14CY2E472J	
R15	Insulated carbon film	470Ω	±5%	1/4W	PD14CY2E471J	
R16	Insulated carbon film	10Ω	±5%	1/4W	PD14CY2E100J	
R17	Insulated carbon film	47kΩ	±5%	1/4W	PD14CY2E473J	
	TRANSISTOR/DIODE/TRANS.					
Q1 ~ 4	2SC373					
Q5	2SA562 (Y)					
Q6, 7	2SC373					
Q8	2SA562 (Y)					
D1 ~ 4	1N60					
D5	SE05-01					
D7, 8	1N60					
T1	Input transformer				L13-0001-05	
	MISCELLANEOUS					
	PC board				J25-0037-04	

● X54-0002-00 ●

	CAPACITOR					
C1	Hi-K ceramic	0.02μF	+80%	−20%	CK94YG1E203Z	
C2	PC electrolytic	10μF	16WV		CE04W1C100	
C3, 4	Mylar	0.012μF	±10%		CQ93M1H123K	
C5	Hi-K ceramic	0.02μF	+80%	−20%	CK94YG1E203Z	
C6, 7	Mylar	0.012μF	±10%		CQ93M1H123K	
C8, 9	PC electrolytic	0.47μF	50WV		CE04W1HR47	
C10	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	
C11	PC electrolytic	10μF	16WV		CE04W1C100	
C12	PC electrolytic	100μF	16WV		CE04W1C101	
C13	Hi-K ceramic	0.01μF	+80%	−20%	CK94YG1E103Z	
	RESISTOR					
R1	Insulated carbon film	15kΩ	±5%	1/4W	PD14BY2E153J	
R2	Insulated carbon film	220kΩ	±5%	1/4W	PD14BY2E224J	
R3	Insulated carbon film	22kΩ	±5%	1/4W	PD14BY2E223J	
R4	Insulated carbon film	10kΩ	±5%	1/4W	PD14BY2E103J	
R5	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R6	Insulated carbon film	10kΩ	±5%	1/4W	PD14BY2E103J	
R7 ~ 9	Insulated carbon film	220kΩ	±5%	1/4W	PD14BY2E224J	
R10 ~ 12	Insulated carbon film	10kΩ	±5%	1/4W	PD14BY2E103J	
R13	Insulated carbon film	3.9kΩ	±5%	1/4W	PD14BY2E392J	
R14	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R15	Insulated carbon film	150Ω	±5%	1/4W	PD14BY2E151J	
R16	Insulated carbon film	100Ω	±5%	1/4W	PD14BY2E101J	

● PARTS LIST

Circuit No.	Description				Part No.	Remarks
R17	Insulated carbon film	15kΩ	±5%	1/4W	PD14BY2E153J	
R18, 19	Carbon composition	2.2Ω	±10%	1/2W	RC05GF2H2R2K	
	TRANSISTOR/DIODE					
Q1	2SC733 (Y) or (GR)					
Q2	2SC734 (Y)					
Q3	2SC735 (Y)					
Q4	2SA562 (Y)					
D1	SM-150-01					
	POTENTIOMETER/PC BOARD					
VR1	PC trimmer potentiometer 10kΩ (B)				R12-3003-05	
–	PC board				J25-0054-04	

● X43-0010-00 ●

	CAPACITOR					
C1	PC electrolytic	100μF	16WV		CE04W1C101	
	RESISTOR					
R1	Insulated carbon film	10kΩ	±5%	1/4W	PD14BY2E103J	
R2	Insulated carbon film	68kΩ	±5%	1/4W	PD14BY2E683J	
R3	Insulated carbon film	330Ω	±5%	1/4W	PD14BY2E331J	
R4	Insulated carbon film	470Ω	±5%	1/4W	PD14BY2E471J	
R5	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
R6	Insulated carbon film	1.8kΩ	±5%	1/4W	PD14BY2E182J	
R7	Insulated carbon film	2.7kΩ	±5%	1/4W	PD14BY2E272J	
R8	Insulated carbon film	2.2kΩ	±5%	1/4W	PD14BY2E222J	
R9	Insulated carbon film	470Ω	±5%	1/4W	PD14BY2E471J	
R10	Insulated carbon film	3.9kΩ	±5%	1/4W	PD14BY2E392J	
R11	Insulated carbon film	1kΩ	±5%	1/4W	PD14BY2E102J	
	TRANSISTOR/DIODE/POTENTIOMETER					
Q1	2SA606 (L)					
Q2～4	2SC372					
D1	RD6AM					
VR1	PC trimmer potentiometer 500Ω (B)				R12-0031-05	
VR2	PC trimmer potentiometer 10kΩ (B)				R12-3003-05	
	PC BOARD					
–	PC board				J25-0028-04	

● X43-0011-00 ●

	CAPACITOR					
C1～7	Hi-K ceramic	0.01μF	+100%	–0%	CK94YZ2H103P	
	RESISTOR					
R1～4	Carbon composition	470kΩ	±10%	1/2W	RC05GF2H474K	
R5, 6	Metal film	470Ω	±5%	2W	RN14AB3D471J	
R7	Carbon composition	1kΩ	±10%	1/2W	RC05GF2H102K	
	DIODE/PC BOARD					
D1～6	SE05-C					
D7	SE05-A					
D8	S1B02-01B					
–	PC board				J25-0055-04	

● BOTTOM VIEW OF TRANSISTOR

2SA606

2SA562
2SA495
2SC372
2SC373
2SC733
2SC734
2SC735

2SC460

2SC871

2SC857
2SC856

3SK22

2SK19

TA7045M

TRIO

Manufactured by TRIO ELECTRONICS INC., TOKYO, JAPAN.