KENWOOD

SERVICE MANUAL

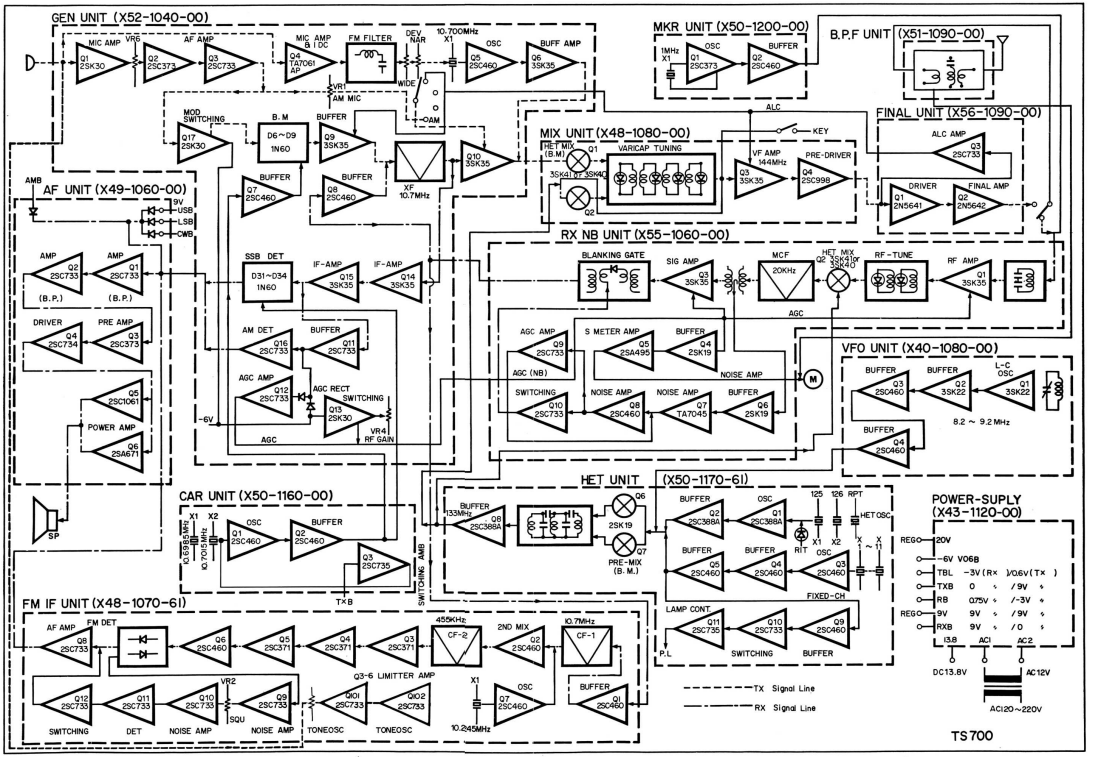
Model TS-700

CONTENTS

SPECIFICATIONS

FREQUENCY RANGE	144 BAND	(T, R)	144 ~ 145 MHz
	145 BAND	(T, R)	145 ~ 146 MHz
	RPT BAND	R	145 ~ 146 MHz
		T	144.4 ~ 145.4 MHz
MODE	SSB, FM, CW, AM		
POWER OUTPUT	10 watts for SSB, CW and FM 3 watts for AM		
ANTENNA IMPEDANCE	50 ohms (unbalanced)		
CARRIER SUPPRESSION	Carrier better than 40 dB down from the output signal		
SIDEBAND SUPPRESSION	Unwanted sideband is better than 40dB down from the output signal		
SPURIOUS RADIATION	Less than –60 dB		
MAX. FREQUENCY DEVIATION (FM)	±10 kHz and 5 kHz, ±5 kHz when shipped		
MODULATION	Balanced modulation for SSB Variable reactance frequency shift for FM Low power modulation for AM		
MICROPHONE	500-ohm dynamic microphone		
AUDIO FREQUENCY RESPONSE	500 to 2500 Hz, within –6 dB		
RPT TONE FREQUENCY	1750 Hz		
RECEIVE CIRCUITRY	Single superheterodyne for SSB, CW and AM Double superheterodyne for FM		
INTERMEDIATE FREQUENCY	10.7 MHz for SSB, CW and AM 10.7 MHz, first IF; 455 kHz, second IF, for FM		
RECEIVER SENSITIVITY	Less than 0.5μV for 10 dB S/N for SSB and CW Less than 1μV for 26 dB S/N for FM Less than 2μV for 10 dB S/N for AM		
IMAGE RATIO	Image frequency better than 60 dB down from the output signal		
IF REJECTION	IF frequency is 60 dB or more down from output signal.		
BANDPASS WIDTH	More than 2.4 kHz at 6 dB down for SSB, CW and AM More than 20 kHz at 6 dB down for FM		
RECEIVER SELECTIVITY	Less than 4.8 kHz at 60 dB down for SSB, CW and AM Less than 40 kHz at 60 dB down for FM		
SQUELCH SENSITIVITY	0.5μV		
AUDIO OUTPUT	More than 2 watts across 8Ω load (10% distortion)		
AUDIO OUTPUT IMPEDANCE	8 ohms		
FREQUENCY STABILITY	Within 200 Hz during any 30 minute period after warmup Within ±4 kHz during the first hour after 1 minute of warmup		
POWER REQUIREMENTS	AC 120/220 volts, 50/60 Hz; DC 12 ~ 16 volts (13.8 volts as reference)		
POWER CONSUMPTION	95 watts (AC 220 V), 4A (DC 13.8 V) for full power transmission 45 watts (AC 220 V), 0.8 A (DC 13.8 V) for no-signal reception		
DIMENSIONS AND WEIGHT	10-15/16" (278 mm) wide x 4-7/8" (124 mm) high x 12-9/16" (320 mm) deep 24.2 lbs (11 kg)		

BLOCK DIAGRAM



TRANSCEIVER FEATURES

1. A fully solid-state, all-mode amateur transceiver, the Model TS-700 provides high-quality communications on SSB, FM, AM and CW in the 144-MHz band.
2. It operates with dual power supply, AC and DC, and is designed for two duties –STATIONARY and MOBILE– with emphasis on stationary duty.
3. The TS-700 is a highly sophisticated amateur radio transceiver with the frequency coverage in two bands, 144 to 145 MHz, and 145 to 146 MHz, respectively. Also included in the equipment are a built-in VFO circuit and an additional provision for RPT operation with the frequency coverage from 145 to 146 MHz for reception, and 144.4 to 145.4 MHz for transmission.
4. A newly developed two-speed dial mechanism facilitates tuning: MAIN TUNING knob (inner) for closer tuning covers a change of 25 kHz by one complete rotation; QUICK (COARSE) TUNING knob (outer) covers a change of 100 kHz similarly. You can tune in quickly with pin-point accuracy – the feature which will prove very useful in receiving single-sideband (SSB) signals.
5. MAIN DIAL is graduated to provide readings accurate to 1 kHz, presenting a circular (360 degrees) scale from zero to 100 kHz. SUB-DIAL is a similar scale graduated in intervals of 50 kHz to cover a total range of 1 MHz for a complete rotation.
6. A total of 11 fixed oscillator circuits (to be loaded with optional crystals) are provided: these selective circuits are good for each of the two selective bands, 144-MHz and 145-MHz, so that you virtually have a total of 22 fixed channels, each for making available a certain operating frequency and closely select the operating frequency within the assigned band. Moreover, a channel-in-use indicating device of our proprietary design is included to tell you visually which of the crystal-loaded channels is in service.
7. A noise blanker (NB) circuit of the type adopted in many other HF products of our make and widely acknowledge for excellent noise eliminating performance is included. Such pulse signals as those coming from automotive ignition systems are beautifully excluded from audio output.
8. For improved FM-mode operation, a squelch circuit of noise filter type is added to the FM unit.
9. Cross-talk and spurious-signal interferences are minimized by the high selectivity secured by, among other things, two special tuning circuits, one being of variable capacitance type built in the RF stage and the other being of High-Q type located on the antenna input side.
10. A balanced-type mixer circuit based on the use of field-effect transistors (FET) has been adopted for the pre-mixer and heterodyne mixer. These mixers assure improved rejection of spurious signals during transmission.
11. The IF stage (SSB, AM, CW) is provided with a 6-element crystal filter. The use of wide-band and narrow-band ceramic filters assures outstanding selectivity during FM reception.
12. The built-in RF gain control is of threshold type and, as such, ensures an optimized S/N ratio at all times in receiving SSB signals.
13. Speaker output is free from distortion: this owes to the amplifier-type AGC circuit. Signals transmitted are accompanied by little or no splutter and free from distortion: this owes to the advanced ALC circuit. The AGC circuit comprises such time-constant elements that this constant is "slow" in SSB mode but "fast" in FM, AM or CW mode.
14. A marker signal circuit, operating with a high-precision crystal oscillator which runs at 1 MHz, is included to enable you to calibrate the tuning dial extremely accurately at the edge of a frequency band.
15. The "S" meter is of our proprietary type, for which patents are pending.
    Its indication does not go beyond and "over the scale" even when an unusually intense signal comes in, as in FM-mode operation. This property of the meter enables you to verify the FM center frequency at the face of this meter.
16. The TS-700 is equipped with a tone oscillator which produces a low-frequency beat tone at 1,750 Hz to call in a repeater station.
17. The ON-AIR lamp lights up when the transceiver shifts itself into transmitting state. This feature keeps you informed of the state of operation at all times.
18. A receiver incremental tuning circuit (RIT) is included as a means of finer tuning. This circuit is particularly useful in SSB and CW modes, and is effective whether you have selected the VFO or any of the 11 fixed channel.
19. The built-in speaker is a large 9 cm by 6 cm one. An extra jack is provided, so that you can drive an external speaker from it.
20. Two kinds of power supply are accepted: AC 120/220 volts (50 or 60 Hz) and DC 13.8 volts. Supply connection is simplified. A DC voltage multiplier of our own development is contained in the transceiver: this multiplier is exceptionally compact and has contributed much to the space-economy design of this model.
21. Significant improvements are embodied in the panel design for making this transceiver much easier to control and use. Dials and knobs are of more advanced type in visual and functional senses; meter illumination and pilot lighting are included by assuming nighttime use of the transceiver; and controls and connectors are laid out according to the principles of human enginnering.
22. Visual aspects were taken as an important criterion in the designing of this transceiver, and have been worked out to present a sharp, high-quality appearance that this model has an appearance that bespeaks the advanced all-mode functions this model is capable of.

Mechanical features too have been treated similarly, with particular emphasis on their reliability.

23. For assuring easier access to the internals, the transceiver enclosure or case is in two parts, complete with special mechanical details to allow the front control panel to be detached. The top half of the case too is detachable; and the rear panel and final-stage unit are so arranged that this unit can be removed as an individual component by and from the rear panel.
24. The handle is provided for easy carrying and handling of this transceiver.
25. A microphone is included among the standard accessories.

CIRCUIT DESCRIPTION

GENERAL

The block diagram of the TS-700 transceiver is shown in page 5, to which the following description is referenced. The network of circuits comprises a total of 66 transistors, augmented by 20 field-effect transistors (FET), 3 ICs and 106 diodes. These circuit elements are arranged in unitized groups, each group being designed to perform a specific function, and are interconnected by printed-circuit conduction paths. An exception from this manner of interconnection is the band-pass filter (BPF).

The receiving section operates on single superheterodyne for SSB mode or on double superheterodyne for FM mode.

The transmitting section produces the SSB signal through a crystal filter circuit for the SSB mode of operation; it operates on direct voltage modulation by variable capacitance for FM mode, on low-power modulation for AM mode, and on block bias keying of double-conversion type for CW mode.

Crystal oscillator frequencies		
CARRIER UNIT	USB	10.6985 MHz
	LSB	10.7015 MHz
	AM & CW	10.7006 MHz
GENERATOR UNIT	FM	10.700 MHz
HET UNIT	144	125.100 MHz
	145	126.100 MHz
	RPT (R)	126.100 MHz
	RPT (T)	125.500 MHz

CARRIER UNIT (X50-1160-00)

This unit provides the carrier frequency for the generator unit in transmitting operation, but operates as a beat frequency oscillator (BFO) for ring-type detection in receiving operation.

Crystals are used for the oscillating elements in the 2-transistor solid-state circuit of this unit. Switching diodes are included for switching between USB, LSB and CW.

GENERATOR UNIT (X52-1040-00)

The single sideband signal for transmitting operation originates in this unit. For the microphone output, a first-stage FET amplifier stage, followed by a two-transistor circuit, constitutes the audio-frequency amplifier, after which comes the 4-diode ring modulator and first-stage buffer. Other circuits are: a ring demodulator for SSB reception, a low-power AM modulator, a direct variable-capacitance modulator for FM transmission, an IF circuit for SSB, AM and CW modes, and an AM detector.

During SSB mode of operation, this unit generates a double sideband (DSB) signal, which casts off one of its sidebands by flowing through the crystal filter circuit, thereby turning to SSB signal.

The carrier for CW mode is obtained by biasing the ring modulator with a DC voltage to break the balance in this modulator.

FM IF UNIT (X48-1070-61)

During receiving operation, this unit takes in the signal from the output of the RX NB unit. The input signal is then passed through its 10.7-MHz ceramic filter and, by mixing, is reduced to 455 kHz. The 455-kHz signal is passed through another ceramic filter, from which it enters the IF stage, in which the signal flows through a limiter circuit and then undergoes FM demodulation. The demodulated signal divides into a squelch circuit and a gate circuit. The squelched output signal is fed back into the gate circuit. TONE generator circuitry is also incorporated.

MIX UNIT (X48-1080-00)

The heterodyne mixer, voltage amplifier and power amplifier of the transmitting section are included in this unit. With the signal coming from the generator unit, a 144-MHz signal is produced in the balanced mixer. This signal undergoes voltage amplification by passing through the pre-driver circuit.

For CW mode, the voltage amplifying FETs are block-biased for keying.

FINAL UNIT (X56-1140-00)

This is a power amplifier unit capable of 10-watt output. Its circuit elements and mechanical parts are all in a compact cluster built on the chassis. It is complete with a heat sink for cooling and also with an ALC circuit.

BPF UNIT (X51-1090-00)

The BPF unit couples the transceiver to the antenna during transmit-receive operation and eliminates spurious signals from the signal being transmitted out. In addition to these two functions, it detects the RF output level.

MARKER UNIT (X50-1200-00)

A 1-MHz crystal oscillator is included, which is the circuit for producing the 1-MHz marker signal to be used for calibration purposes.

RX-NB UNIT (X55-1060-00)

The received RF signal is amplified, beaten down by heterodyne mixing and then filtered in this unit before it is forwarded to the IF circuit terminating with a blanking gate. For the filtering action, a crystal filter is employed. The noise blanking gate is a part of the noise blanker (NB) circuit included in this unit. When the NB switch (on the panel) is OFF, the IF signal emerging from the filter flows through the IF circuit without encountering any obstruction. If this switch is ON, the path of the IF signal is turned on or off at the blanking gate according as the noise component of the RF signal is small or large.

Improved noise detection and elimination are secured here by subjecting both signal components —information and noise— to transistorized detection of amplitude and frequency. The noise blanking scheme so formed is particularly effective where the noise is radically dissimilar to the information signal in terms of frequency com-

position and amplitude. A good example of this is the SSB signal against the noise due to the ignition system of a motor car running nearby.
A high-level noise with its frequencies extending beyond the IF band to the information signal frequency is hard to discriminate for noise blanking. Interference noises coming from high-frequency welding machines or corona-discharge machines, for instance, are similar to SSB signals in the sense mentioned above, and are hard for the noise blanker circuit to isolate them from the desired signal; possible results are distorted output voices. The transceiver should not be blamed for such distortion.

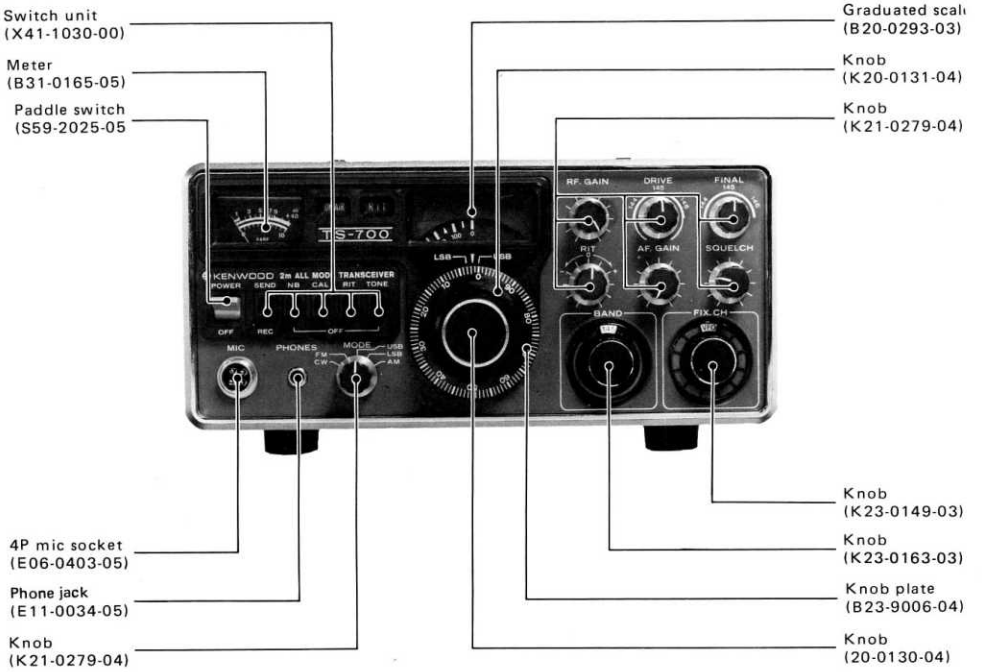
HET UNIT (X50-1170-61)
The 133-MHz band signal for hetrodyning purposes is made available from this HET unit. This signal is produced by mixing, in a balanced-type mixer circuit, the 125-MHz band oscillator output and the 8-MHz band VFO unit output or one of the fixed-channel crystal oscillators. The mixing stage is followed by a band-pass filter, which prevents leakage of high-frequency energy from the unit.

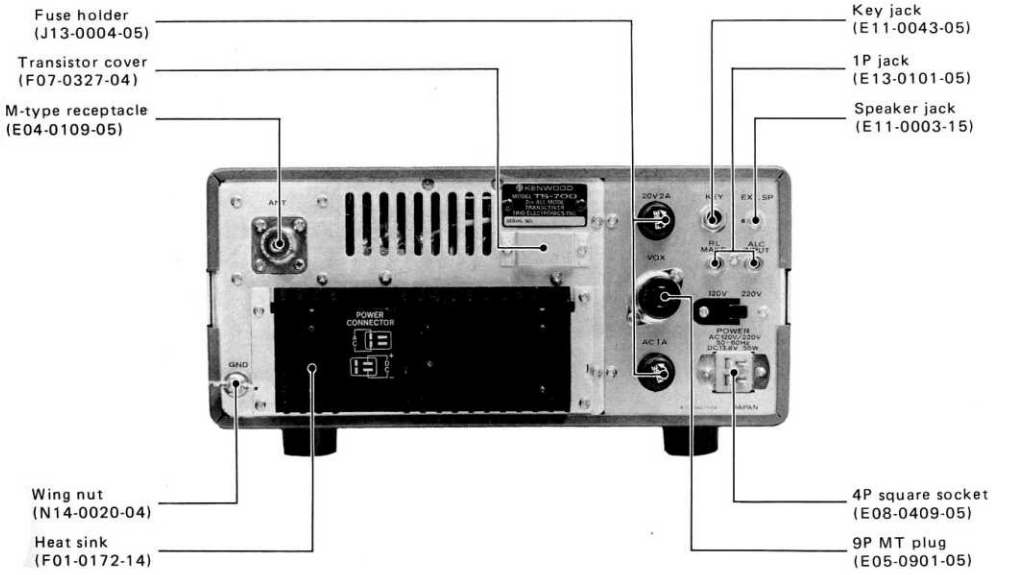
VFO UNIT (X40-1080-00)
A perfectly shielded unit, this voice frequency oscillator provides extra-stable oscillation by its circuitry designed with 2 FETs, 2 transistors and 2 diodes. It is of the same type that is used in the TS-900.
Several adjustments of extremely delicate nature are involved in this unit. The user is cautioned not to disturb these adjustments, which are accurately factory-set. Any circuit alteration of mechanical modification, if attempted by the user, shall release the manufacturer from all obligations under the warranty.

AF UNIT (49-1060-00)
This is the final stage in the receiving section; it amplifies the audio-frequency signal derived from the received signal; it is by this amplified AF signal that the speaker is driven. Two stages of band amplification and 2 stages of AF amplification, plus a complementary amplifier, constitute the circuitry of this unit. Load impedance is 8 ohms.

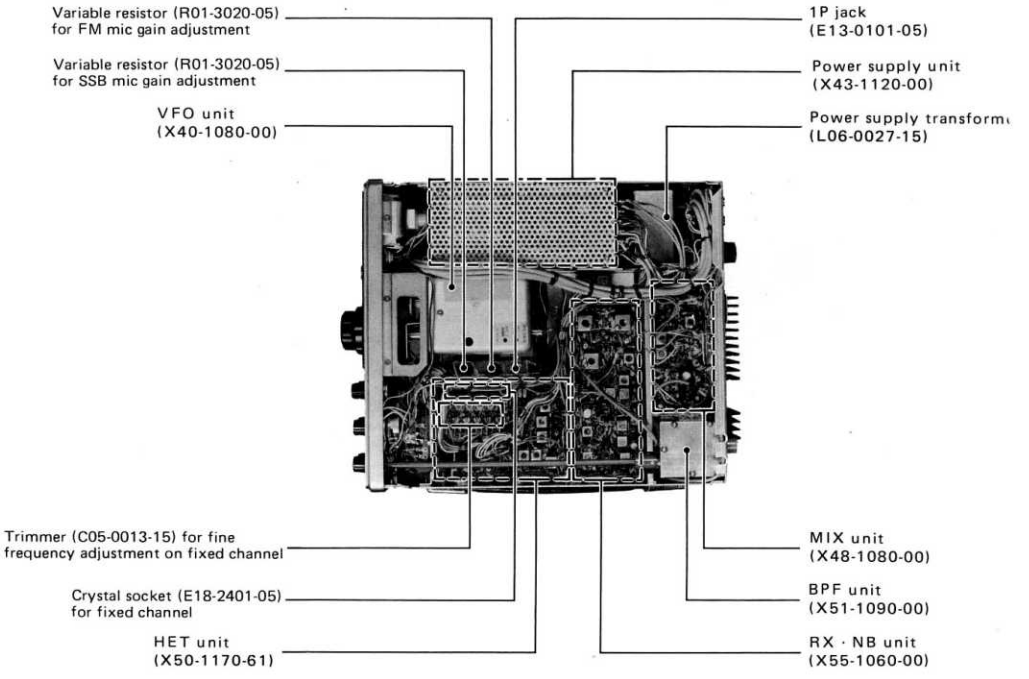
POWER SUPPLY UNIT (X43-1120-00)
So that the TS-700 transceiver can be operated on two kinds of power, AC and DC, an AC bridge rectifier is built in this unit. The rectifier provides 13.8 volts DC, which is multiplied to 20 volts – the voltage needed by the AF unit and FINAL unit.
The 9-volt DC power supply for some units is made available by reducing the 13.8 volts through an IC chip having voltage stabilizing capability.
The other supply voltages are derived by tapping from the 20-volt and 9-volt supply circuits.
In order to facilitate wiring work for interconnecting the units thus far described, interconnecting terminals are marked with symbols. Terminals with like symbols are connected to each other except where this manner of terminal identification is not practical or permissible.

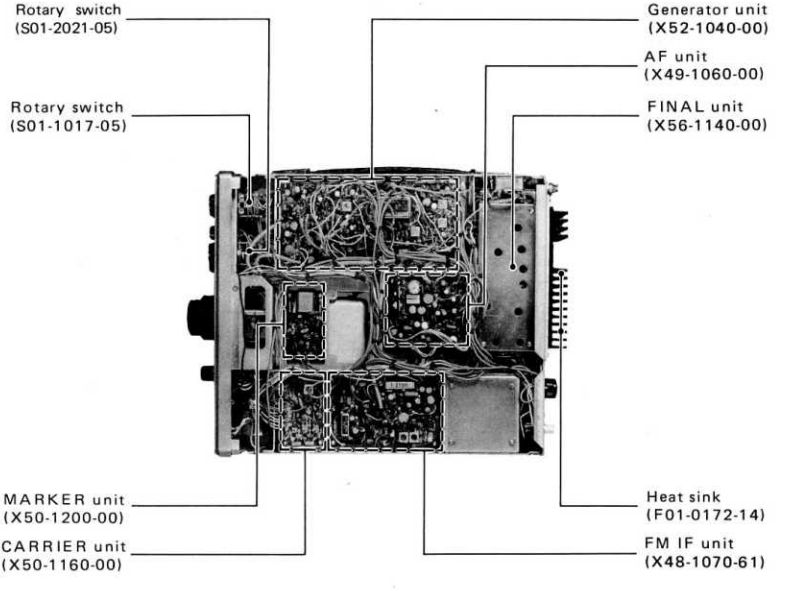
EXTERNAL VIEW





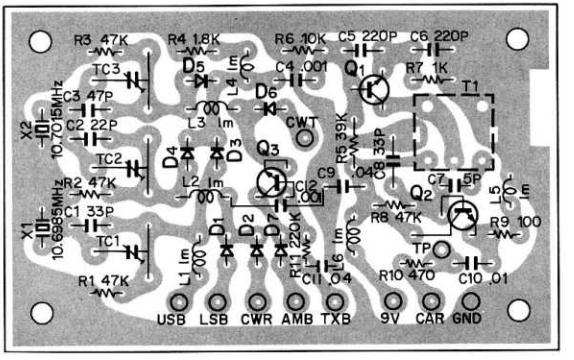
PARTS ALIGNMENT





PC BOARD

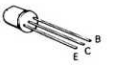
CARRIER UNIT (X50-1160-00)



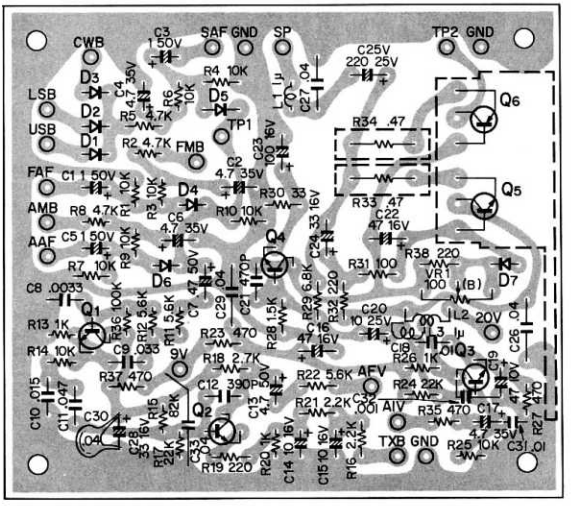
Q1, 2 : 2SC460(B) Q2 : 2SC733(Y) D1 ~ 7 : 1S155

Q1, 2 : 2SC460(B)

Q3 : 2SC733(Y)



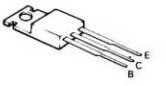
AF UNIT (X49-1060-00)



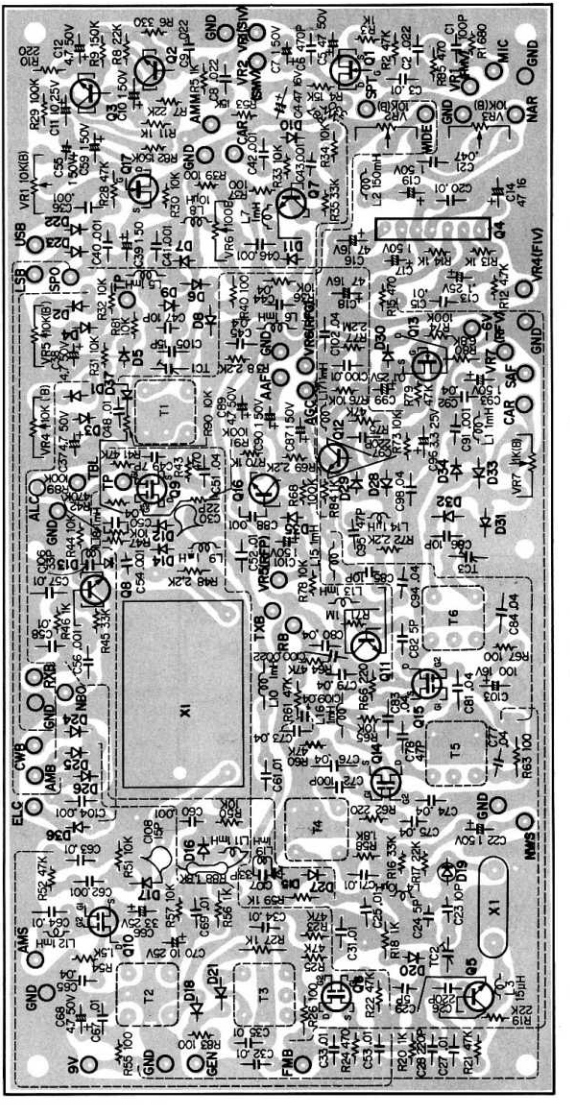
Q2,2 : 2SC733(O) Q3 : 2SC373 Q4 : 2SC734(Y)
Q5 : 2SC1061(A) Q6 : 2SA671(A) D1 ~ 6 : 1S155 D7 : RV-1

Q1, 2 : 2SC733(O)
Q3 : 2SC373
Q4 : 2SC734(Y)

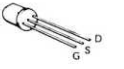
Q5 : 2SC1061(A)
Q6 : 2SA671(A)



GENERATOR UNIT (X52-1040-00)

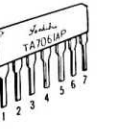


Q1, 13, 17 : 2SK30



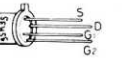
Q2 : 2SC373
Q3, 11, 12, 16 : 2SC733(Y)

Q4 : TA7061AP



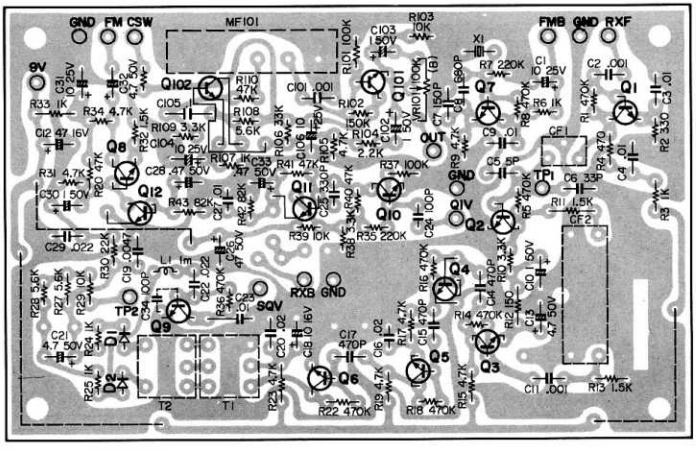
Q5, 7, 8 : 2SC460(B)

Q6, 9, 10 : 3SK35(GR or BL)
Q14, 15 : 3SK35(GR)



Q1, 13, 17 : 2SK30(O) Q2 : 2SC373 Q3, 11, 12, 16 : 2SC733(Y)
Q4 : TA7061AP Q5, 7, 8 : 2SC460(B) Q6, 9, 10 : 3SK35(GR or BL)
Q14, 15 : 3SK35(GR) D1 ~ 5, 10, 18, 20 ~ 26, 30, 35 : 1S1555 D6 ~ 9
28, 29, 31 ~ 34 : 1N60 D11 ~ 17, 27 : 1S73(A) D19 : 1S2208 D36 : V06C

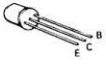
FM-IF UNIT (X48-1070-61)



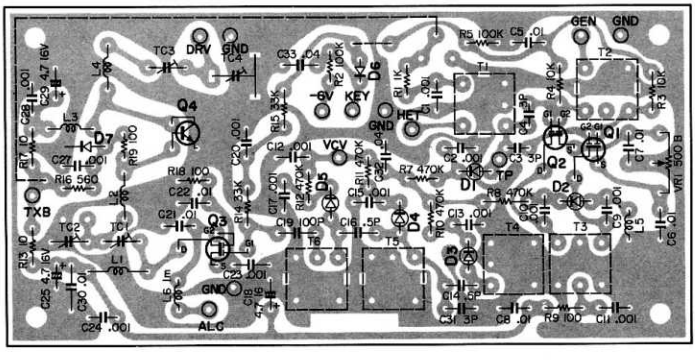
Q1, 2, 6, 7 : 2SC460B Q3 ~ 5 : 2SC371(O) Q8 ~ 12 : 2SC733(Y)
D1, 2 : 1N60 D3 : 1S1555

Q1, 2, 6, 7 : 2SC460(B)

Q3 ~ 5 : 2SC371(O)
Q8 ~ 12 : 2SC733(Y)

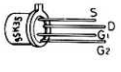


MIX UNIT (X48-1080-00)



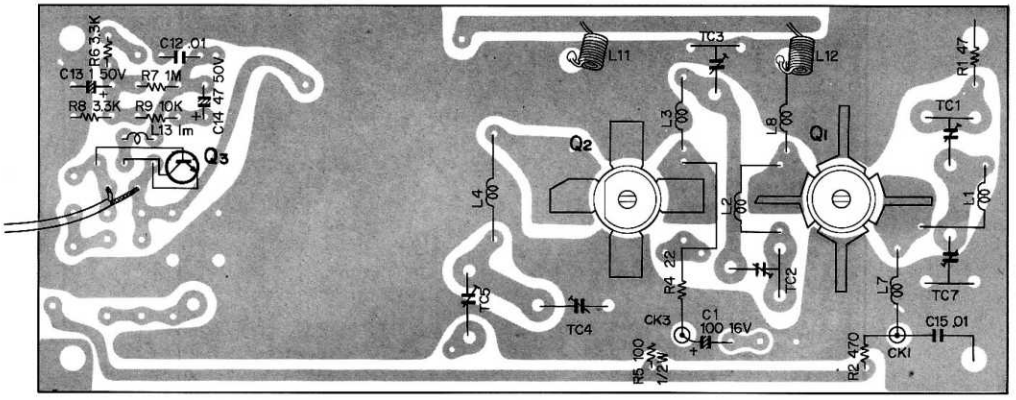
Q1, 2 : 3SK41 (L or M) Q3 : 3SK35 (GR or BL) Q4 : 2SC998 D1 ~ 1S2208
D6, 7 : 1S1555

Q1, 2 : 3SK41 (L) or (M)
Q3 : 3SK35 (GR) or (BL)



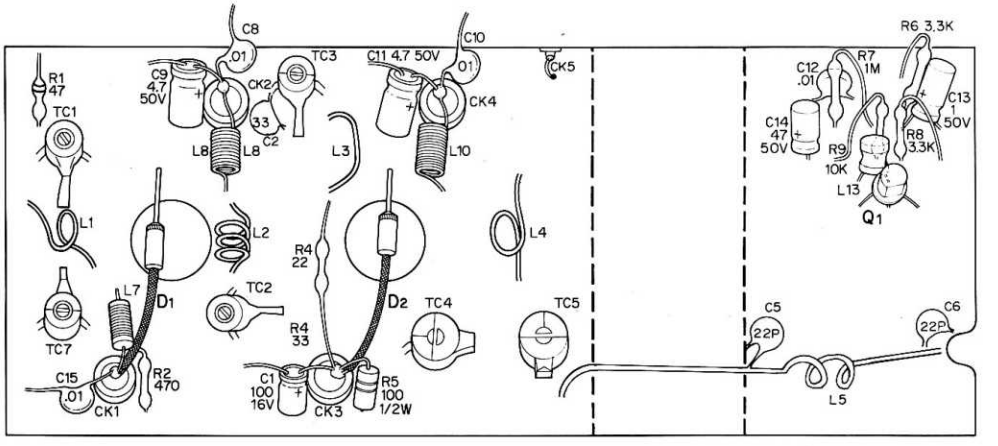
Q4 : 2SC998

FINAL UNIT (X56-1140-00 (A))



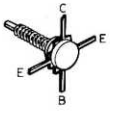
Q1 : 2N5641 Q2 : 2N5642 Q3 : 2SC733(Y)

FINAL UNIT (X56-1140-00 (B))

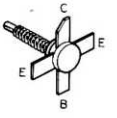


D1, 2 : 1S1555

Q1 : 2N5641

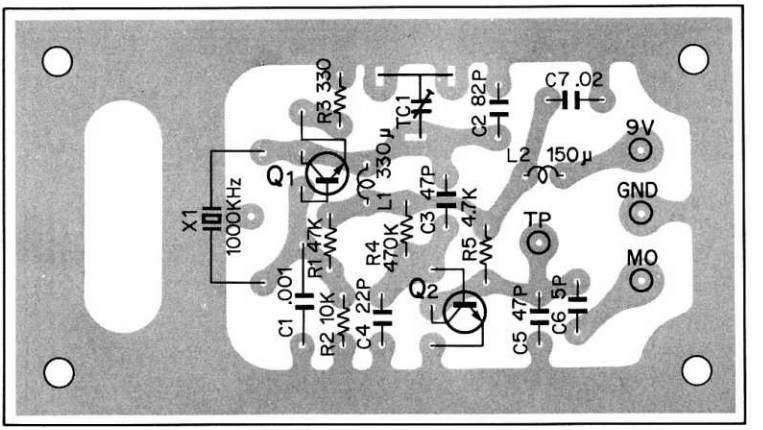


Q2 : 2N5642



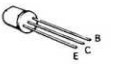
Q3 : 2SC733(Y)

MARKER UNIT (X50-1200-00)



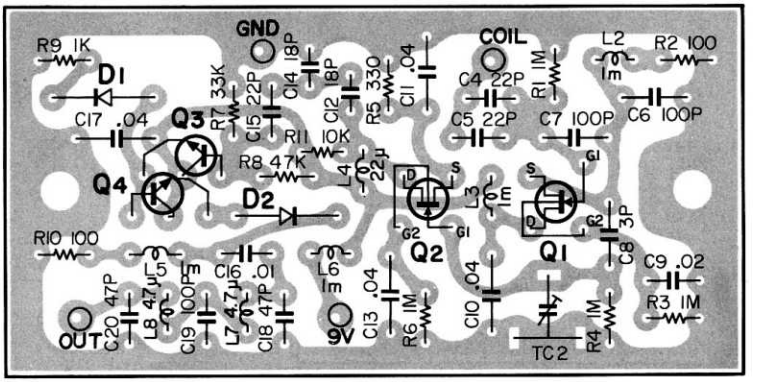
Q1 : 2SC373 Q2 : 2SC460(B)

Q1 : 2SC373



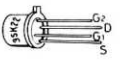
Q2 : 2SC460(B)

VFO UNIT (X40-1080-00)



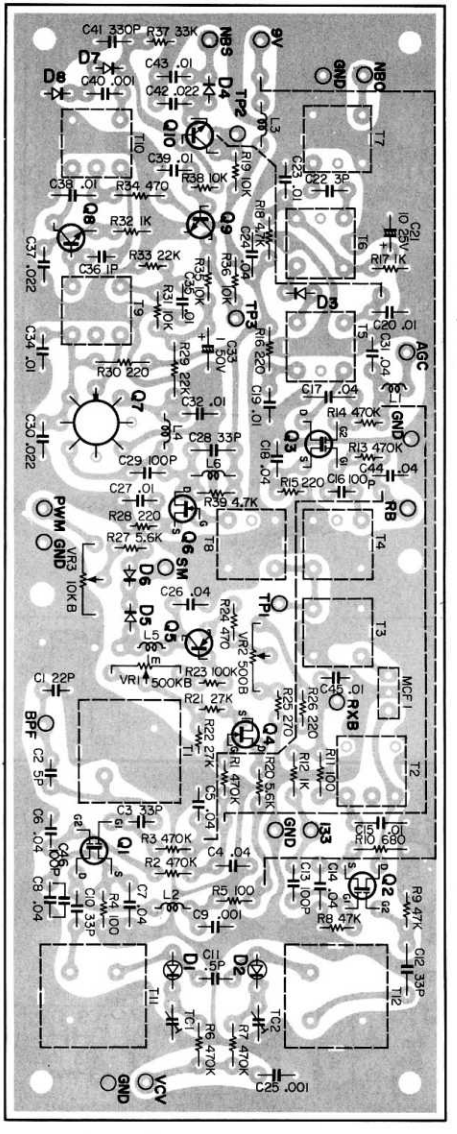
Q1, 2 : 3SK22(Y) Q3, 4 : 2SC460(B) D1, 21N60

Q1, 2 : 3SK22(Y)



Q3, 4 : 2SC460(B)

RX · NB UNIT (X55-1060-00)

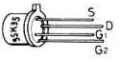


Q1 : 3SK35(GR or BL) Q2 : 3SK41(M)
Q3 : 3SK35(GR) Q4, 6 : 2SK19(GR)
Q5 : 2SA495 Q7 : TA7045M(R) Q8 : 2SC460(B)
Q9, 10 : 2SC733(Y) D1, 2 : 1S2208 D3 : 1S73A
D4 ~ 8 : 1N60

Q8

Q9, 10

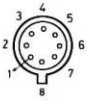
Q1 : 3SK35(GR) or (BL)
Q2 : 3SK41(M)
Q3 : 3SK35(GR)



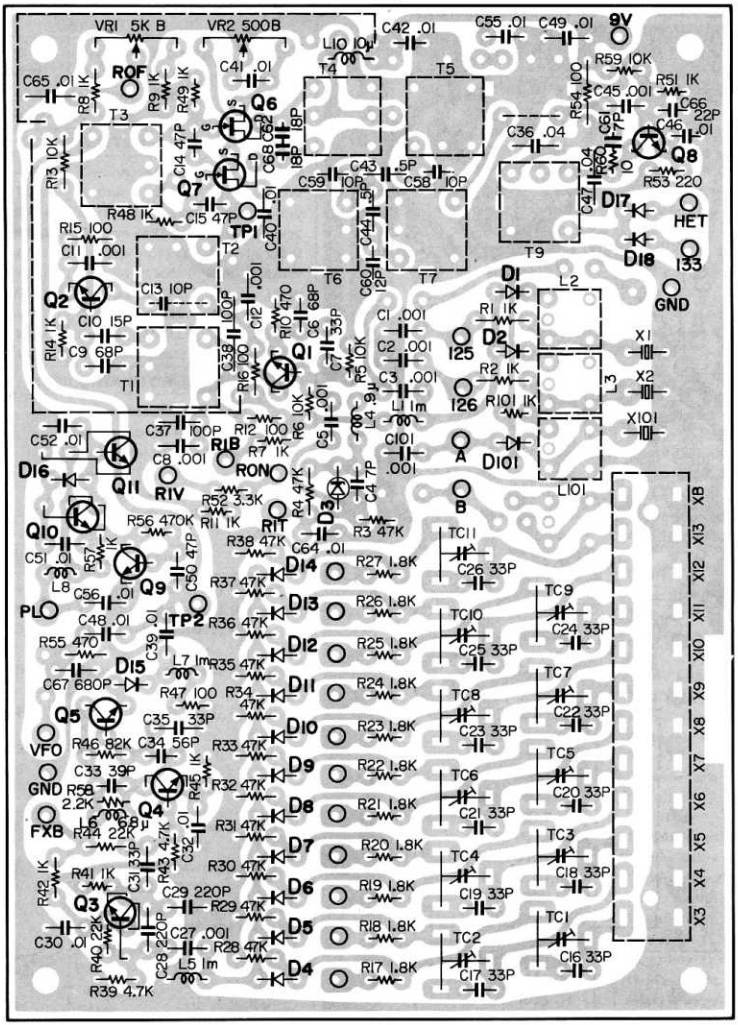
Q4, 6 : 2SK19*GR)

Q5 : 2SA495

Q7 : TA7045M(R)

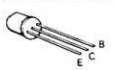


HET UNIT (X50-1170-61)



Q1, 2, 8 : 2SC388A Q3～5, 9 : 2SC460B Q6, 7 : 2SK19(GR) Q10 : 2SC733(Y)
Q11 : 2SC735(Y) D1, 2, 4～14, 17, 18 : 1S1555 D3 : 1S2208 D15, 16 : 1N60

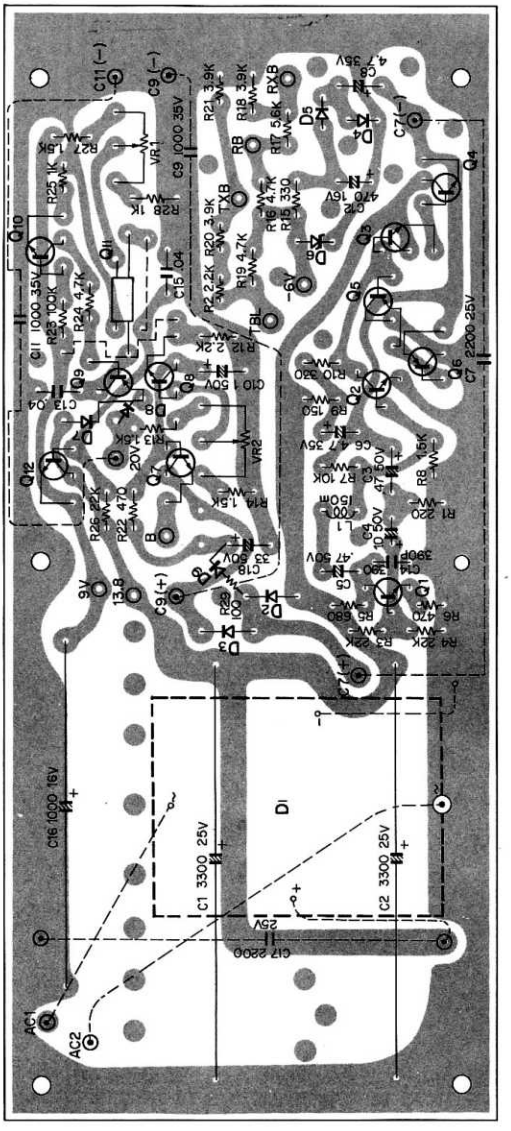
Q1, 2, 8 : 2SC388A
Q10, 11 : 2SC733(Y)



Q3～5, 9 : 2SC460B

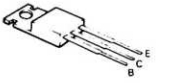
Q6, 7 : 2SK19(GR)

POWER SUPPLY UNIT (X43-1120-00)

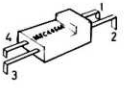


Q1, 3, 7, 8, 10 : 2SC733(Y)
Q2 : 2SC734(Y)
Q5, 9 : 2SA495

Q4, 12 : 2SD235(Y)
Q6 : 2SA671(B)



Q11 : MFC4060A



Q1, 3, 7, 8, 10 : 2SC733(Y) Q2 : 2SC734(Y)
Q4, 12 : 2SD235(Y) Q5, 9 : 2SA495 Q6 : 2SA671(B)
Q11 : MFC4060A D1 : DS10BN-L D2, 3 : U05B
D4, 5, 10 : V06B D6 : WZ061 D7 : 1S1555

PARTS LIST

TS-700 TRANSCEIVER (overall parts list)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1	C90-0187-05	Ceramic 0.0047μF	
C2	CK45E1H103P	Ceramic 0.01μF +100% −0%	
C3	CK45F1H103Z	Ceramic 0.01μF +80% −20%	
C4	CC45SL1H050D	Ceramic 5pF ±0.5pF	
		RESISTOR	
R1, 2	PD14BY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R3	PD14BY2E103J	Carbon 10kΩ ±5% 1/4W	
R4	PD14BY2E473J	Carbon 47kΩ ±5% 1/4W	
R5	PD14BY2E470J	Carbon 47Ω ±5% 1/4W	
R6	PD14BY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R7	PD14BY2E331J	Carbon 330Ω ±5% 1/4W	
R8	PD14BY2E561J	Carbon 560Ω ±5% 1/4W	
R9	PD14BY2E471J	Carbon 470Ω ±5% 1/4W	
R101	PD14BY2E103J	Carbon 10kΩ ±5% 1/4W	
R102	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
		SEMICONDUCTOR	
Q1		Transistor 2SD235 (Y)	
Q2		Transistor 2SA671 (A)	
Q3		Transistor 2SC733 (Y)	
D1, 2		Diode Y06J (yellow)	
D4		Diode WZ061	
D5		Zener diode RD7A	
D6		Diode 1N60	
		POTENTIOMETER	
VR1	R03-4035-05	Potentiometer 50kΩ (A) for AF	
VR2	R03-3055-05	Potentiometer 10kΩ (B) for SQU	
VR3	R08-3014-05	Potentiometer 10kΩ (B) for DRIV	
VR4, 5	R03-3055-05	Potentiometer 10kΩ (B) for RF, RIT	
VR6, 7	R01-3020-05	Potentiometer 10kΩ (A) for FM, MIC, SSB MIC	
VR8	R12-3022-05	Potentiometer	
VR101	R12-5014-05	Potentiometer 100kΩ	
		SWITCH AND RELAY	
S1	S01-1015-15	Rotary switch 1-step 2-circuit 5 points for MODE	
S2	S01-1017-05	Rotary switch 1-step 4-circuit 3 points for BAND	
S3	S01-2021-05	Rotary switch 2-step 2-circuits 12 points for FIX. CHAN.	
S101	S31-2027-05	Supply voltage selector switch	
S1	S59-2025-05	Power on-off switch (paddle) (orange)	
RL1	S51-1012-05	Relay	
RL2	S51-6001-05	Relay	
		COIL AND TRANSFORMER	
T1	L06-0027-15	Power transformer	
L1	L33-0101-05	Ferri-inductor	
		MISCELLANEOUS	
–	A01-0226-03	Case (a) upper	
–	A01-0227-03	Case (B) lower	
–	A13-0079-02	Frame (A) (Power supply, VFO)	
–	A13-0080-03	Frame (B) (Marker, AF)	
–	A13-0081-03	Frame (C) (FM-IF)	
–	A13-0082-03	Frame (D) (Side board right)	
–	A13-0083-13	Frame (E) (Mix, BPF, RXNB)	

Ref. No.	Parts No.	Description	Remarks
–	A21-0159-03	Ornament panel	
–	A23-0454-03	Rear panel (A)	
–	A23-0467-04	Rear panel (B)	
–	A30-0084-04	Dial backing plate	
–	B01-0083-05	Panel escutcheon	
–	B01-0081-03	Escutcheon (A)	
–	B01-0082-03	Escutcheon (B)	
–	B07-0108-02	Dial escutcheon	
–	B07-0125-04	Switch grille	
–	B10-0140-04	Front glass	
–	B19-0156-04	Filter x 2	
–	B20-0293-03	Dial calibration	
–	B21-3033-04	Meter hand	
–	B23-3011-04	Indicating plate	
–	B23-9006-04	Knob plate	
–	B30-0007-05	Lamp	
–	B30-0079-05	Lamp x 4	
–	B31-0165-05	Meter	
–	B40-0938-04	Nameplate	
–	B42-0477-04	Connector nameplate	
–	B42-0478-04	Mic adjustment nameplate	
–	B42-0481-04	Lettering sheet	
–	B43-0199-04	Batch	
–	B50-1160-00	Instruction manual	
–	B58-0158-00	Caution sheet for supply voltage	
–	D21-0341-04	Shaft	
–	D22-0002-04	Shaft coupling	
–	D23-0048-04	Bearing	
–	D32-0021-04	Switch stopper	
–			
–	E01-0903-05	9PMT socket	
–	E05-0901-05	9PMT plug	
–	E06-0403-05	4P mic socket	
–	E08-0409-05	4P square socket	
–	E09-0204-05	2P plug	
–	E11-0003-15	Speaker jack	
–	E11-0034-05	Horn jack	
–	E11-0043-05	Key jack	
–	E12-0001-05	Ear phone plug	
–	E13-0101-05	1P pin jack x 3	
–	E14-0101-05	1P pin plug x 4	
–	E15-0038-05	Lamp socket	
–	E22-0207-05	Lug plate 1L 2P x 2	
–	E22-0405-05	Lug plate 1L 4P x 3	
–	E22-0603-05	Lug plate 1L 6P	
–	E23-0015-04	Oval lug terminal	
–	E23-0037-04	Shaft grounding fitting	
–	F05-1023-05	Fuse 1A x 2	
–	F05-2023-05	Fuse 2A x 2	
–	F05-5022-05	Fuse 5A	
–	F07-0326-04	Power supply shield cover	
–	F07-0327-04	Transistor cover	
–	F14-0072-04	Light-shield socket x 2	
–	F15-0164-04	Speaker mask	
–	F15-0165-04	Switch mask	
–	F20-0078-05	Insulator (mica)	
–	G01-0230-04	Coil spring	
–	H01-1119-04	Packaging case (inner)	

Ref. No.	Parts No.	Description	Remarks
–	H03-0320-04	Packaging case (outer)	
–	H10-0570-04	Polystyrene foamed fixture	
–	H10-0998-14	Polystyrene foamed fixture x 2	
–	H10-1000-04	Polystyrene foamed fixture	
–	H10-1002-13	Polystyrene foamed fixture x 2	
–	H10-0570-04	Polystyrene foamed fixture	
–	H20-0378-04	Protective cover	
–	H25-0016-00	Accessory bag	
–	H25-0036-00	Accessory bag	
–	J02-0022-05	Leg, 15φ x 4	
–	J02-0049-14	Leg, 28φ x 6	
–	J13-0004-05	Fuse holder x 2	
–	J19-0381-04	Meter retainer	
–	J19-0382-04	Socket retainer	
–	J19-0383-04	Lamp retainer	
–	J19-0408-04	Lead wire retainer	
–	J21-0448-04	Speaker retainer	
–	J21-1191-04	PC board retainer	
–	J21-1192-04	Rotary switch retainer	
–	J21-1193-04	Mounting metal	
–	J30-0061-04	Rubber spacer x 2	
–	J31-0110-04	Collar	
–	J32-0188-04	Hexagonal boss (D)	
–	J32-0189-04	Hexagonal boss (A) x 4	
–	J32-0190-04	Hexagonal boss (B) x 4	
–	J32-1030-14	Round boss x 2	
–	J39-0028-04	Spacer x 2	
–	J59-0001-05	Grommet x 2	
–	J59-0002-05	Plunger x 2	
–	J61-0018-05	Beads band x 5	
–	J61-0019-05	Vinyl tie x 60	
–	K01-0055-05	Handle	
–	K20-0130-04	Knob (A)	
–	K20-0131-04	Knob (B)	
–	K21-0279-04	Knob (C) x 7	
–	K23-0057-04	Knob (rubber) x 2	
–	K23-0147-04	Knob (F) x 5	
–	K23-0149-03	Knob (E)	
–	K23-0163-03	Knob	
–	T13-0006-05	Speaker	
–	T91-0029-05	Microphone	
–	X40-1080-00	VFO unit	
–	X41-1030-00	Switch unit	
–	X42-1070-60	Power cord assembly	
–	X42-1050-00	DC cord assembly	
–	X43-1120-00	Power supply unit	
–	X48-1070-61	FM IF unit	
–	X48-1080-00	MIX unit	
–	X49-1060-00	AF unit	
–	X50-1160-00	CARRIER unit	
–	X50-1170-61	HET unit	
–	X50-1200-00	MARKER unit	
–	X51-1090-00	BPF unit	
–	X52-1040-00	GENERATOR unit	
–	X55-1060-00	RX NB unit	
–	X56-1140-00	FINAL unit	

BPF UNIT (X51-1090-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1	CE04W1H4R7	Electrolytic 4.7μF 50WV	
C2	CC45CH2H020C	Ceramic 2pF ±0.25pF	
VC1	C03-0061-05	Mideget-type variable capacitor	
		SEMICONDUCTOR	
D1		Diode 1N60	
		COILS	
L1	L33-0089-05	Ferri inductor	
L2	L34-0440-05	Coil (B)	
L3	L34-0441-05	Coil (C)	
		MISCELLANEOUS	
J5	E04-0109-05	Type M receptacle	
–	E22-0207-04	Lug terminal	
–	E23-0001-05	Hermetic terminal x 2	
–	F07-0323-04	BPF shield cover (A)	
–	F07-0324-04	BPF shield cover (B)	
–	F11-0193-03	BPF shield case	

CARRIER UNIT (X50-1160-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1	CC45SL1H330J	Ceramic 33pF ±5%	
C2	CC45SL1H220J	Ceramic 22pF ±5%	
C3	CC45SL1H470J	Ceramic 47pF ±5%	
C4	CK45E1H102P	Ceramic 0.001μF +100% –0%	
C5, 6	CC45SL1H221J	Ceramic 220pF ±5%	
C7	CC45SL1H050D	Ceramic 5pF ±0.5pF	
C8	CC45SL1H330J	Ceramic 33pF ±5%	
C9	CK45F1H403Z	Ceramic 0.04μF +80% –20%	
C10	CK45F1H103Z	Ceramic 0.01μF +80% –20%	
C11	CK45F1H403Z	Ceramic 0.04μF +80% –20%	
C12	CK45E1H102P	Ceramic 0.001μF +100% –0%	
TC1 ~ 3	C05-0013-15	Trimer 20pF	
		RESISTOR	
R1 ~ 3	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R4	PD14CY2E182J	Carbon 1.8kΩ ±5% 1/4W	
R5	PD14CY2E393J	Carbon 39kΩ ±5% 1/4W	
R6	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R7	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R8	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R9	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R10	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R11	PD14CY2E224J	Carbon 220kΩ ±5% 1/4W	
		SEMICONDUCTOR	
Q1, 2		Transistor, 2SC460 (B)	
Q3		Transistor, 2SC733 (Y)	
D1 ~ 7		Diode, 1S1555	
		COIL AND TRANSFORMER	
T1	L30-0265-05	Intermediate-frequency transformer (IFT), 10.7 MHz	
L1 ~ 6	L33-0104-05	Ferri-inductor	

Ref. No.	Parts No.	Description	Remarks
		MISCELLANEOUS	
–	E23-0047-04	Wrapping terminal x 10	
–	J25-0942-04	Printed-circuit board	
X1	L77-0355-05	Crystal oscillator, 10.6985 MHz	
X2	L77-0356-05	Crystal oscillator, 10.7015 MHz	

GENERATOR UNIT (X52-1040-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1	CC45SL1H101J	Ceramic 100pF ±5%	
C2	CK45F1H223Z	Ceramic 0.022μF +80%–20%	
C3	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C4	CE04W1C470(RL)	Electrolytic 47μF 16WV	
C5	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C6	CK45B1H471J	Ceramic 470pF ±5%	
C7	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C8, 9	CQ92M1H223K	Mylar film 0.022μF ±10%	
C10	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C11	CE04W1E100(RL)	Electrolytic 10μF 25WV	
C12	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C13	C90-0076-05	Tantalum 0.1μF 25WV	
C14	CE04W1C470(RL)	Electrolytic 47μF 16WV	
C15	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C16	CE04W1C470(RL)	Electrolytic 47μF 16WV	
C17	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C18	CE04W1C470(RL)	Electrolytic 47μF 16WV	
C19	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C20	CQ92M1H103K	Mylar 0.01μF ±10%	
C21	CQ92M1H473K	Mylar 0.047μF ±10%	
C22	CE04W1H010(RL)	Chemical 1μF 50WV	
C23	CC45SL1H100D	Ceramic 10pF ±0.5pF	
C24	CC45CH1H050D	Ceramic 5pF ±0.5pF	
C25	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C26	CC45CH1H221J	Ceramic 220pF ±5%	
C27	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C28	CC45CH1H221J	Ceramic 220pF ±5%	
C29	CC45CH1H050D	Ceramic 5pF ±0.5pF	
C30	CC45CH1H220J	Ceramic 22pF ±5%	
C31 ~35	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C36	CK45D1H102M	Ceramic 0.001μF ±20%	
C37, 38	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C39	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C40	CK45D1H102M	Ceramic 0.001μF ±20%	
C41	CK45D1H103M	Ceramic 0.01μF ±20%	
C42,43	CK45D1H102M	Ceramic 0.001μF ±20%	
C44,45	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C46	CK45D1H102M	Ceramic 0.001μF ±20%	
C47	CC45CH1H100D	Ceramic 10pF ±0.5%	
C48	CK45D1H103Z	Ceramic 0.01μF +80%–20%	
C49	CC45CH1H070D	Ceramic 7pF ±0.5pF	
C50,51	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C52,53	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C54	CC45D1H102M	Ceramic 0.001μF ±5%	
C55	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C56	CK45D1H102M	Ceramic 0.001μF ±20%	
C57,58	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C59	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C60	CK45D1H102M	Ceramic 0.001μF ±20%	
C61	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C62	CK45D1H102M	Ceramic 0.001μF ±20%	
C63,64	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C65	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C66	CE04W1E330(RL)	Electrolytic 33μF 25WV	
C67	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C68	CE04W1H4R7	Electrolytic 4.7μF 50WV	
C69	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C70	CE04W1E100(RL)	Electrolytic 10μF 25WV	
C71	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C72	CC45SL1H101K	Ceramic 100pF ±5%	
C73~77	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C78	CC45SL1H470J	Ceramic 47pF ±5%	
C79~81	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C82	CC45CH1H050D	Ceramic 5pF ±0.5pF	
C83,84	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C85,86	CC45CH1H100D	Ceramic 10pF ±0.5%	
C87	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C88	CQ92M1H102J	Mylar 0.001μF ±10%	
C89	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C90	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C91	CK45D1H102M	Ceramic 0.001μF ±20%	
C92	CK45F1H403Z	Ceramic 0.04μF 50WV	
C93	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C94	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C95	CC45CH1H470J	Ceramic 47pF ±5%	
C96	CE04W1E3R3(RL)	Electrolytic 3.3μF 25WV	
C97	CC45CH1H221J	Ceramic 220pF ±5%	
C98	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C99	C90-0076-05	Tantalum 0.1μF 25WV	
C100	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C101	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C102	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C103	CE04W1C101(RL)	Electrolytic 100μF 16WV	
C104	CK45D1H102M	Ceramic 0.001μF ±20%	
C105	CC45CH1H150J	Ceramic 15pF ±5%	
C106, 107	CC45C1H330J	Ceramic 33pF ±5%	
C108	CC45CH1H150J	Ceramic 15pF ±5%	
C109	CK45F1H403Z	Ceramic 0.04μF +80%–20%	
C110	CK45F1H223Z	Ceramic 0.022μF +80%–20%	
TC1	C05-0030-15	Ceramic trimmer 20pF	
TC2	C05-0031-15	Ceramic trimmer 10pF	
TC3	C05-0030-15	Ceramic trimmer 20pF	
		RESISTORS	
R1	PD14CY2E681J	Carbon 680Ω ±5% 1/4W	
R2	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R3	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R4	PD14CY2E153J	Carbon 15kΩ ±5% 1/4W	
R5	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R6	PD14CY2E331J	Carbon 330Ω ±5% 1/4W	
R7, 8	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R9	PD14CY2E154J	Carbon 150kΩ ±5% 1/4W	
R10	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R11	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R12	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R13	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R14	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R15	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R16	PD14CY2E333J	Carbon 33kΩ ±5% 1/4W	
R17	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R18	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R19	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	

Ref. No.	Parts No.	Description	Remarks
R20	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R21~23	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R24	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R25	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R26	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R27	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R28	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R29	PD14CY2E104J	Carbon 100kΩ±5% 1/4W	
R30~34	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R35	PD14CY2E333J	Carbon 33kΩ ±5% 1/4W	
R36	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R37	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R38	PD14CY2E222J	Carbon 2.2kΩ ±5% 1/4W	
R39,40	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R41	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R42	PD14CY2E474J	Carbon 470kΩ±5% 1/4W	
R43	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R44	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R45	PD14CY2E333J	Carbon 33kΩ ±5% 1/4W	
R46	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R47	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R50	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R51	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R52	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R53	PD14CY2E153J	Carbon 15kΩ ±5% 1/4W	
R54	PD14CY2E152J	Carbon 1.5kΩ ±5% 1/4W	
R55	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R56	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R57	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R58	PD14CY2E182J	Carbon 1.8kΩ ±5% 1/4W	
R59	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R60	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R61	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R62	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R63	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R64	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R65	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R66	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R67	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R68	PD14CY2E104J	Carbon 100kΩ±5% 1/4W	
R69	PD14CY2E222J	Carbon 2.2kΩ ±5% 1/4W	
R70	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R71	PD14CY2E105J	Carbon 1MΩ ±5% 1/4W	
R72	PD14CY2E222J	Carbon 2.2kΩ ±5% 1/4W	
R73	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R74	PD14CY2E104J	Carbon 100kΩ±5% 1/4W	
R75	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R76	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R77	RC05GF2H225J	Carbon 2.2MΩ±5% 1/4W	
R78	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R79	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R80	PD14CY2E682J	Carbon 6.8kΩ ±5% 1/4W	
R81	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R82	PD14CY2E154J	Carbon 150kΩ±5% 1/4W	
R83	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R84	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R85	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R86	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R87	PD14CY2E331J	Carbon 330Ω ±5% 1/4W	
R88	PD14CY2E182J	Carbon 1.8kΩ ±5% 1/4W	
R89,90	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R91	PD14CY2E105J	Carbon 100kΩ±5% 1/4W	

Ref. No.	Parts No.	Description	Remarks
SEMICONDUCTOR			
Q1		FET 2SK30 (O)	
Q2		Transistor 2SC373	
Q3		Transistor 2SC733 (Y)	
Q4		Integrated circuit TA7061AP	
Q5		Transistor 2SC460B	
Q6		FET 3SK35 (GR or BL)	
Q7, 8		Transistor 2SC460B	
Q9, 10		FET 3SK35 (GR or BL)	
Q11, 12		Transistor 2SC733 (Y)	
Q13		FET 2SK30 (O)	
Q14,15		FET 3SK35 (GR)	
Q16		Transistor 2SC733 (Y)	
Q17		FET 2SK30 (O)	
D1~5		Diode 1S1555	
D6~9		Diode 1N60	
D10		Diode 1S1555	
D11~17		Diode 1S73A	
D18		Diode 1S1555	
D19		Diode 1S2208	
D20~26		Diode 1S1555	
D27		Diode 1S73A	
D28, 29		Diode 1N60	
D30		Diode 1S1555	
D31~34		Diode 1N60	
D35		Diode 1S1555	
D36		Diode V06C	
D37		Diode 1S1555	
POTENTIOMETER			
VR1~5	R12-3025-05	Potentiometer 10kΩ (B)	
VR6	R12-0048-05	Potentiometer 100Ω (B)	
VR7	R12-1020-05	Potentiometer 1kΩ (B)	
COIL/TRANSFORMER			
T1~6	L30-0264-05	IFT	
L1	L33-0104-05	Ferri-inductor 1mH	
L2	L33-0127-05	Ferri-inductor 150mH	
L3	L33-0090-05	Ferri-inductor 15μH	
L4	L33-0089-05	Ferri-inductor 10μH	
L5~7	L33-0104-05	Ferri-inductor 1mH	
L8	L33-0089-05	Ferri-inductor 10μH	
L9~13	L33-0104-05	Ferri-inductor 1mH	
L14	L33-0085-05	Ferri-inductor 1μH	
L15~19	L33-0104-05	Ferri-inductor 1mH	
L20	L33-0096-05	Ferri-inductor 100μH	
MISCELLANEOUS			
–	E23-0047-04	Wrapping terminal x 29	
–	F10-0330-04	Shield plate	
–	F10-0334-04	Shield plate	
–	J25-0943-13	Printed-circuit board	
XF	L71-0022-05	Crystal filter 10.7 MHz	
X1	L77-0357-05	Crystal oscillator 10.745 MHz	

FM IF UNIT (X48-1070-61)

Ref. No.	Parts No.	Description	Re-marks
CAPACITORS			
C1	CE04W1E100(RL)	Electrolytic 10μF 25WV	
C2	CK45D1H102M	Ceramic 0.001μF ±20%	
C3, 4	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C5	CC45CH1H050D	Ceramic 5pF ±0.5pF	
C6	CC45SL1H330J	Ceramic 33pF ±5%	
C7	CC45CH1H151J	Ceramic 150pF ±5%	
C8	CM93D1H681J(Z)	Mica 680pF ±5%	
C9	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C10	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C11	CK45D1H102M	Ceramic 0.001μF ±20%	
C12	CE04W1C470(RL)	Electrolytic 47μF 16WV	
C13	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C14,15	CC45SL1H471J	Ceramic 470pF ±5%	
C16	CK45F1H203Z	Ceramic 0.02μF +80%–20%	
C17	CC45SL1H471J	Ceramic 470pF ±5%	
C18	CE04W1C100(RL)	Electrolytic 10μF 16WV	
C19	CQ92M1H472K	Mylar film 0.0047μF ±10%	
C20	CK45F1H203Z	Ceramic 0.02μF +80%–20%	
C21	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C22	CQ92M1H223K	Mylar film 0.022μF ±10%	
C23	CQ92M1H103K	Mylar film 0.01μF ±10%	
C24	CC45CH1H101J	Ceramic 100pF ±5%	
C25	CC45SL1H331J	Ceramic 330pF ±5%	
C26	CE04W1H470(RL)	Electrolytic 47μF 50WV	
C27	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C28	CE04W1HR47(RL)	Electrolytic 0.47μF 50WV	
C29	CQ92M1H223K	Mylar 0.022μF ±10%	
C30	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C31	CE04W1E100(RL)	Electrolytic 10μF 25WV	
C32	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C33	CE04W1HR47(RL)	Electrolytic 0.47μF 50WV	
C34	CC45SL1H101K	Ceramic 100pF ±10%	
C101	CQ92M1H103K	Mylar 0.001μF ±10%	
C102, 103	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C104	CE04W1E100(RL)	Electrolytic 10μF 25WV	
C105	CQ92M1H104K	Mylar 0.1μF ±10%	
C106	CE04W1E100(RL)	Electrolytic 10μF 25WV	
RESISTOR			
R1	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R2	PD14CY2E331J	Carbon 330Ω ±5% 1/4W	
R3	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R4	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R5	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R6	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R7	PD14CY2E224J	Carbon 220kΩ ±5% 1/4W	
R8	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R9	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R10	PD14CY2E332J	Carbon 3.3kΩ ±5% 1/4W	
R11	PD14CY2E152J	Carbon 1.5kΩ ±5% 1/4W	
R12	PD14CY2E151J	Carbon 150Ω ±5% 1/4W	
R13	PD14CY2E152J	Carbon 1.5kΩ ±5% 1/4W	
R14	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R15	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R16	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R17	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R18	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R19	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R20	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	

Ref. No.	Parts No.	Description	Re-marks
R22	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R23	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R24,25	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R27,28	PD14CY2E562J	Carbon 5.6kΩ ±5% 1/4W	
R29	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R30	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R31	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R32	PD14CY2E152J	Carbon 1.5kΩ ±5% 1/4W	
R33	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R34	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R35	PD14CY2E224J	Carbon 220kΩ ±5% 1/4W	
R36	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R37	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
R38	PD14CY2E332J	Carbon 3.3kΩ ±5% 1/4W	
R39	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R40, 41	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R42,43	PD14CY2E823J	Carbon 82kΩ ±5% 1/4W	
R101	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
R102	PD14CY2E154J	Carbon 150kΩ ±5% 1/4W	
R103	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R104	PD14CY2E222J	Carbon 2.2kΩ ±5% 1/4W	
R105	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R106	PD14CY2E333J	Carbon 33kΩ ±5% 1/4W	
R107	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R108	PD14CY2E562J	Carbon 5.6kΩ ±5% 1/4W	
R109	PD14CY2E332J	Carbon 3.3kΩ ±5% 1/4W	
R110	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R111	PD14CY2E331J	Carbon 330Ω ±5% 1/4W	
SEMICONDUCTOR			
Q1,2		Transistor 2SC460B	
Q3~5		Transistor 2SC371 (O)	
Q6,7		Transistor 2SC460B	
Q8~12		Transistor 2SC733 (Y)	
Q101, 102		Transistor 2SC733 (Y)	
D1,2		Diode 1N60	
COIL			
T1	L30-0006-05	DESCRI coil (D) 455kHz	
T2	L30-0007-05	DESCRI coil (E) 455kHz	
L1	L33-0104-05	Ferri inductor 1mH	
POTENTIOMETER			
VR101	R12-5014-05	Potentiometer 100kΩ (B)	
MISCELLANEOUS			
CF1	L72-0015-05	Ceramic filter SFC-10.7MA	
CF2	L72-0016-05	Ceramic filter CFR-455D	
MF101	L79-0015-05	Piezo-electric tuning fork	
X1	L77-0327-05	Crystal oscillator	

MIX UNIT (X48-1080-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1,2	CK45E1H102P	Ceramic 0.001μF +100%–0%	
C3,4	CC45SL1H030C	Ceramic 3pF ±0.25pF	
C5~8	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C9~13	CK45E1H102P	Ceramic 0.001μF +100%–0%	
C14	CC45SL1H0R5C	Ceramic 0.5pF ±0.25pF	
C15	CK45E1H102P	Ceramic 0.001μF +100%–0%	
C16	CC45SL1H0R5C	Ceramic 0.5pF ±0.25pF	
C17	CK45E1H102P	Ceramic 0.001μF +100%–0%	
C18	CE04W1C4R7	Electrolytic 4.7μF 16WV	
C19	CC45SL1H101J	Ceramic 100pF ±5%	
C20	CK45E1H102P	Ceramic 0.001μF +100%–0%	
C21,22	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C23,24	CK45E1H102P	Ceramic 0.001μF +100%–0%	
C25	CE04W1C4R7	Electrolytic 4.7μF 16WV	
C27,28	CE45E1H102P	Ceramic 0.001μF +100%–0%	
C29	CE04W1C4R7	Electrolytic 4.7μF 16WV	
C30	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C31	CC45SL1H030C	Ceramic 3pF ±0.25pF	
C32,33	CK45F1E403Z	Ceramic 0.04μF +80%–20%	
TC1~3	C05-0030-05	Trimmer capacitor 20pF	
TC4	C05-0015-15	Trimmer capacitor 40pF	
		RESISTOR	
R1	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R2	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
R3,4	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R5	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
R7,8	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R9	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R10~12	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R13	PD14CY2E100J	Carbon 10Ω ±5% 1/4W	
R14,15	PD14CY2E333J	Carbon 33kΩ ±5% 1/4W	
R16	PD14CY2E561J	Carbon 560Ω ±5% 1/4W	
R17	PD14CY2E100J	Carbon 10Ω ±5% 1/4W	
R18,19	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
		SEMICONDUCTOR	
Q1,2		FET 3SK41 (L or M)	
Q3		FET 3SK35 (GR or BL)	
Q4		Transistor 2SC998	
D1~5		Diode 1S2238	
D6,7		Diode 1S1555	
		POTENTIOMETER	
VR1	R12-0042-05	Potentiometer 500Ω (B)	
		COIL AND TRANSFORMER	
T1	L31-0180-05	IFT 133MHz	
T2	L30-0264-05	IFT 10.7MHz	
T3	L31-0321-05	IFT 144MHz	
T4	L31-0322-05	Tuning coil 144MHz	
T5	L31-0266-05	IFT 144MHz	
T6	L31-0323-05	Tuning coil 144MHz	
L1	L34-0353-05	VHF coil	
L2	L34-0442-05	VHF coil	
L3	L34-0448-05	VHF coil	
L4	L34-0352-05	VHF coil	
L5	L33-0220-05	RFC choke coil 2.4μH	
L6	L33-0104-05	Ferri-inductor	
L7	L33-0232-05	Choke coil 0.7μH	
		MISCELLANEOUS	
–	E23-0047-04	Wrapping terminal x 11	
–	F02-0004-05	Cooler	
–	J25-0946-13	Printed-circuit board	

FINAL UNIT (X56-1140-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1	CE041A101(RL)	Electrolytic 100μF 10WV	
C2	CC45SL2H330K	Ceramic 33pF ±10%	
C5,6	CM93D2H220J-(DM)	Mica 22pF ±5%	
C8	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C9	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C10	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C11	CE04W1H4R7(RL)	Electrolytic 4.7μF 50WV	
C12	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C13	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C14	CE04W1HR47(RL)	Electrolytic 0.47μF 50WV	
C15	CK45E2H103P	Ceramic 0.01μF +100%–0%	
CK1~5	CK18E2H102P	Ceramic 0.001μF +100%–0%	
TC1	C05-0029-15	Trimmer capacitor 50pF	
TC2	C05-0056-05	Trimmer capacitor 30pF	
TC3	C05-0029-15	Trimmer capacitor 50pF	
TC4,5	C05-0054-05	Trimmer capacitor 60pF	
		RESISTOR	
R1	PD14BY2E470J	Carbon 47Ω ±5% 1/4W	
R2	PC05GF2E471J	Carbon 470Ω ±5% 1/4W	
R4	PD14BY2E220J	Carbon 22Ω ±5% 1/4W	
R5	RC05GF2H101J	Carbon 100Ω ±5% 1/4W	
R6	PD14CY2E332J	Carbon 3.3kΩ ±5% 1/4W	
R7	PD14CY2E105J	Carbon 1MΩ ±5% 1/4W	
R8	PD14CY2E332J	Carbon 3.3kΩ ±5% 1/4W	
R9	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
		SEMICONDUCTOR	
Q1		Transistor 2N5641	
Q2		Transistor 2N5642	
Q3		Transistor 2SC733 (Y)	
D1,2		Diode 1S1555	
		COIL	
L1	L34-0432-05	VHF coil (A)	
L2	L34-0433-05	VHF coil (B)	
L3	L34-0435-05	VHF coil (D)	
L4	L34-0444-05	VHF coil (E)	
L6	L31-0325-05	Coil	
L7	L33-0219-05	RFC choke coil 0.2μH/100Ω	
L8	L33-0222-05	Choke coil	
L10~12	L33-0222-05	Choke coil	
L13	L33-0104-05	Ferri inductor	

Ref. No.	Parts No.	Description	Remarks
		MISCELLANEOUS	
–	E23-0001-05	Terminal x 9	
–	F01-0172-14	Heat sink	
–	F01-0173-13	Heat sink (B)	
–	F07-0325-04	Final shield cover	
–	F11-0196-03	Shield case	
–	G02-0056-04	Grounding spring x 2	
–	J25-0941-03	Printed-circuit board	
–	J31-0109-04	Spacer ring x 4	
–	J32-0191-04	Hexagonal boss (C) x 4	

MARKER UNIT (X50-1200-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITORS	
C1	CM93D1H102J(Z)	Mica 0.001μF ±5%	
C2	CC45TH1H820J	Ceramic 82pF ±5%	
C3	CC45CH1H470J	Ceramic 47pF ±5%	
C4	CC45CH1H220J	Ceramic 22pF ±5%	
C5	CC45CH1H470J	Ceramic 47pF ±5%	
C6	CC45CH2H050D	Ceramic 0.5pF ±0.25pF	
C7	CK45F1H203Z	Ceramic 0.02μF +80%–20%	
		RESISTORS	
R1	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R2	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R3	PD14CY2E331J	Carbon 330Ω ±5% 1/4W	
R4	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R5	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
		SEMICONDUCTORS	
Q1		Transistor 2SC373	
Q2		Transistor 2SC460 (B)	
		COIL	
L1	L33-0100-05	Ferri inductor	
L2	L33-0098-05	Ferri inductor	
		MISCELLANEOUS	
–	E23-0047-04	Wrapping terminal x 4	
–	J25-0978-04	Printed-circuit board	
X1	L77-0366-05	Crystal oscillator	

RX NB UNIT (X55-1060-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1	CC45CH1H220J	Ceramic 22pF ±5%	
C2	CC45CH1H050D	Ceramic 5pF ±0.5pF	
C3	CC45SL1H330J	Ceramic 33pF ±5%	
C4~6	CK45D1E403Z	Ceramic 0.04μF +80%–20%	
C7,8	CK45F1E403Z	Ceramic 0.04μF +80%–20%	
C9	CK45D1H102M	Ceramic 0.001μF ±20%	

Ref. No.	Parts No.	Description	Remarks
C10	CC45SL1H330J	Ceramic 33pF ±5%	
C11	CC45SL1H0R5C	Ceramic 0.5pF ±0.25pF	
C12	CC45SL1H330L	Ceramic 33pF ±5%	
C13	CC45SL1H101J	Ceramic 100pF ±5%	
C14	CK45D1E403Z	Ceramic 0.04μF +80%–20%	
C15	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C16	CC45SL1H101K	Ceramic 100pF ±5%	
C17,18	CK45D1E403Z	Ceramic 0.04μF +80%–20%	
C19,20	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C21	CE04W1E100(RL)	Electrolytic 10μF 25WV	
C22	CC45SL1H030C	Ceramic 3pF ±0.25pF	
C23	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C24	CK45D1E403Z	Ceramic 0.04μF +80%–20%	
C25	CK45D1H102M	Ceramic 0.001μF ±20%	
C26	CK45F1E403Z	Ceramic 0.04μF +80%–20%	
C27	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C28	CC45SL1H330J	Ceramic 33pF ±5%	
C29	CC45SL1H101J	Ceramic 100pF ±5%	
C30	CK45D1H223P	Ceramic 0.022μF +100%–0%	
C31	CK45D1E403Z	Ceramic 0.04μF +80%–20%	
C32	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C33	CE04W1H010(RL)	Electrolytic 1μF 50WV	
C34,35	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C36	CC45SL1H010D	Ceramic 1pF ±0.5pF	
C37	CK45D1H223P	Ceramic 0.022μF +100%–0%	
C38,39	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C40	CK45D1H102M	Ceramic 0.001μF ±20%	
C41	CC45SL1H331J	Ceramic 330pF ±5%	
C42	CK45D1H223P	Ceramic 0.022μF +100%–0%	
C43	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C44	CK45F1E403Z	Ceramic 0.04μF +80%–20%	
C45	CK45F1H103Z	Ceramic 0.01μF +80%–20%	
C46	CC45SL1H101J	Ceramic 100pF ±5%	
TC1,2	C05-0030-15	Ceramic Trimmer 20pF	
		RESISTOR	
R1~3	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R4,5	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R6,7	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R8,9	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R10	PD14CY2E681J	Carbon 680Ω ±5% 1/4W	
R11	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R12	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R13,14	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R15,16	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R17	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R18	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R19	pd14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R20	PD14CY2E562J	Carbon 5.6kΩ ±5% 1/4W	
R21,22	PD14CY2E273J	Carbon 27kΩ ±5% 1/4W	
R23	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
R24	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R25	PD14CY2E271J	Carbon 270Ω ±5% 1/4W	
R26	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R27	PD14BY2E562J	Carbon 5.6kΩ ±5% 1/4W	
R28	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R29	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R30	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R31	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R32	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R33	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R34	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R35,36	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R37	PD14CY2E333J	Carbon 33kΩ ±5% 1/4W	

Ref. No.	Parts No.	Description	Remarks
R38	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R39	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
	SEMICONDUCTOR		
Q1		FET 3SK35 (GR or BL)	
Q2		FET 3SK41 (M) or 35K40 (M)	
Q3		FET 3SK35 (GR)	
Q4		FET 2SK19 (GR)	
Q5		Transistor 2SA495	
Q6		FET 2SK19 (GR)	
Q7		IC TA7045M (R)	
Q8		Transistor 2SA460 (B)	
Q9, 10		Transistor 2SC733 (Y)	
D1,2		Diode 1S2208	
D3		Diode 1S73A	
D4~8		Diode 1N60	
	POTENTIOMETER		
VR1	R12-7013-05	Potentiometer 500kΩ (B)	
VR2	R12-0042-05	Potentiometer 500Ω (B)	
VR3	R12-3025-05	Potentiometer 10kΩ (B)	
	COIL AND TRANSFORMER		
T1	L31-0319-05	Coil (A) 144MHz	
T2,3	L30-0265-05	IFT 10.7MHz	
T4~8	L30-0264-05	IFT 10.7MHz	
T9,10	L30-0265-05	IFT 10.7MHz	
T11	L31-0320-05	Coil (B) 144MHz	
T12	L31-0324-05	Coil (C) 144MHz	
L1	L33-0104-05	Ferri inductor 1mH	
L2	L33-0220-05	Choke coil 2.4μH	
L3~5	L33-0104-05	Ferri inductor 1mH	
L6	L33-0220-05	Choke coil 2.4μH	
	MISCELLANEOUS		
–	E23-0047-04	Wrapping terminal x 17	
–	F11-0113-04	Shield case x 3	
–	J25-0949-13	Printed-circuit board	
MCF	L71-0021-05	Monolithic filter 10F20AG	

HET UNIT (X50-1170-61)

Ref. No.	Parts No.	Description	Remarks
	CAPACITOR		
C1~3	CK45B1H102K	Ceramic 0.001μF ±10%	
C4	CC45SL1H070D	Ceramic 7pF ±0.5pF	
C5	CK45B1H102K	Ceramic 0.001μF ±10%	
C6	CC45SL1H680J	Ceramic 68pF ±5%	
C7	CC45SL1H330J	Ceramic 33pF ±5%	
C8	CK45B1H102J	Ceramic 0.001μF ±10%	
C9	CC45SL1H680J	Ceramic 68pF ±5%	
C10	CC45SL1H150J	Ceramic 15pF ±5%	
C11,12	CK45B1H102K	Ceramic 0.001μF ±10%	
C13	CC45SL1H100D	Ceramic 10pF ±0.5pF	
C14,15	CC45SL1H470J	Ceramic 47pF ±5%	
C16~26	CC45SL1H330J	Ceramic 33pF ±5%	
C27	CK45B1H102K	Ceramic 0.001μF ±10%	
C28,29	CC45SL1H221J	Ceramic 220pF ±5%	
C30	CK45F1H103Z	Ceramic 0.01μF +80%,–20%	
C31	CC45SL1H330J	Ceramic 33pF ±5%	
C32	CK45F1H103Z	Ceramic 0.01μF +80%,–20%	
C33	CC45SL1H390J	Ceramic 39pF ±5%	
C34	CC45SL1H560J	Ceramic 56pF ±5%	
C36	CK45F1H403Z	Ceramic 0.04μF +80%,–20%	
C37,38	CC45SL1H101J	Ceramic 100pF ±5%	
C39~42	CK45F1H103Z	Ceramic 0.01μF +80%,–20%	
C43,44	CC45SL1H0R5C	Ceramic 0.5pF ±0.25pF	
C45	CK45B1H102K	Ceramic 0.001μF ±10%	
C46	CK45F1H103Z	Ceramic 0.01μF +80%,–20%	
C47	CK45F1H403Z	Ceramic 0.04μF +80%,–20%	
C48,49	CK45F1H103Z	Ceramic 0.01μF +80%,–20%	
C50	CC45SL1H470J	Ceramic 47pF ±5%	
C51,52	CK45F1H103Z	Ceramic 0.01μF +80%,–20%	
C55,56	CK45F1H103Z	Ceramic 0.01μF +80%,–20%	
C58,59	CC45SL1H100D	Ceramic 10pF ±0.5pF	
C60	CC45SL1H120J	Ceramic 12pF ±5%	
C61	CC45SL1H070D	Ceramic 7pF ±0.5pF	
C62	CC45SL1H180D	Ceramic 18pF ±0.5pF	
C64,65	CK45F1H103Z	Ceramic 0.01μF +80%,–20%	
C66	CC45SL1H220J	Ceramic 22pF ±5%	
C68	CC45SL1H180D	Ceramic 18pF ±0.5pF	
C101	CK45B1H102K	Ceramic 0.001μF ±10%	
TC1~11	C05-0013-15	Ceramic trimmer 20pF	
	RESISTOR		
R1,2	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R3,4	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R5,6	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R7~9	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R10	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R11	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R12	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R13	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R14	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R15,16	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R17~27	PD14CY2E182J	Carbon 1.8kΩ ±5% 1/4W	
R28~38	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R39	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R40	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R41,42	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R43	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R44	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R45	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R46	PD14CY2E823J	Carbon 82kΩ ±5% 1/4W	
R47	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R48,49	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R51	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R52	PD14CY2E332J	Carbon 3.3kΩ ±5% 1/4W	
R53	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R54	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R55	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R56	PD14CY2E474J	Carbon 470kΩ ±5% 1/4W	
R57	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R58	PD14CY2E222J	Carbon 2.2kΩ ±5% 1/4W	
R59	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R60	PD14CY2E100J	Carbon 10Ω ±5% 1/4W	
R101	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	

Ref. No.	Parts No.	Description	Remarks
		SEMICONDUCTOR	
Q1,2	Transistor	Transistor 2SC388A	
Q3~5		Transistor 2SC460B	
Q6,7		FET 2SK19 (GR)	
Q8		Transistor 2SC388A	
Q9		Transistor 2SC460B	
Q10		Transistor 2SC733 (Y)	
Q11		Transistor 2SC735 (Y)	
D1,2		Diode 1S1555	
D3		Diode 1S2208	
D4~14		Diode 1S1555	
D15,16		Diode 1N60	
D17,18		Diode 1S1555	
D101		Diode 1S1555	
		POTENTIOMETER	
VR1	R12-2015-05	Potentiometer 5kΩ (B)	
VR2	R12-0042-05	Potentiometer 500Ω (B)	
		COIL AND TRANSFORMER	
T1,2	L31-0180-05	IFT 144MHz	
T3	L30-0268-05	IFT 8.7MHz	
T4	L31-0321-05	Tuning coil 144MHz	
T5	L31-0322-05	Tuning coil 144MHz	
T6	L31-0179-05	IFT 144MHz	
T7	L31-0180-05	IFT 144MHz	
T9	L31-0180-05	IFT 144MHz	
L1	L33-0104-05	Ferri inductor	
L2,3	L34-0437-05	Oscillator coil 125, 126MHz	
L4	L34-0438-05	Coil 0.9μH	
L5	L33-0104-05	Ferri inductor 1mH	
L6	L33-0144-05	Ferri inductor 6.8μH	
L7	L33-0104-05	Ferri inductor 1mH	
L8	L33-0085-05	Ferri inductor 1μH	
L101	L34-0437-05	Oscillator coil 1mH	
		MISCELLANEOUS	
–	E18-2401-05	Crystal socket 12P	
–	F23-0047-04	Wrapping terminal x 34	
–	J25-0947-13	Printed-circuit board	
X1	L77-0358-05	Crystal 125. 109-1/3MHz	
X2	L77-0359-05	Crystal 125. 109-1/3MHz	
X101	L77-0363-05	Crystal 125. 509-1/3MHz	

VFO UNIT (X40-1080-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1	CC45PG1H180J	Ceramic 18pF ±5% (temp. compensation)	
C2	CC45PG1H220J	Ceramic 22pF ±5% (temp. compensation)	
C3	CC45PG1H390J	Ceramic 39pF ±5% (temp. compensation)	
C4	CC45PG1H220J	Ceramic 22pF ±5% (temp. compensation)	
C5	CC45LG1H220J	Ceramic 22pF ±5% (temp. compensation)	
C6,7	CM93F2A101J (DM)	Mica 100pF ±5%	
C8	CM93D1H030D (Z)	Mica 3pF ±0.5pF	
C9	CK45E1H203P	Ceramic 0.02μF +100%,–0%	
C10,11	CK45E1H403P	Ceramic 0.04μF +100%,–0%	
C12	CM93D1H180J (Z)	Mica 18pF ±5%	
C13	CK45E1H403P	Ceramic 0.04μF +100%,–0%	
C14	CM93D1H180J (Z)	Mica 18pF ±5%	
C15	CM93D1H220J (Z)	Mica 22pF ±5%	
C16	CK45E1H103P	Ceramic 0.01μF +100%,–0%	
C17	CK45E1H403P	Ceramic 0.04μF +100%,–0%	
C18	CC45SL1H470J	Ceramic 47pF ±5%	
C19	CC45SL1H101J	Ceramic 100pF ±5%	
C20	CC45SL1H470J	Ceramic 47pF ±5%	
VC1	C01-0177-05	Variable capacitor	
TC1	C03-0001-05	Midget variable capacitor	
TC2	C05-0013-15	Ceramic trimmer 20pF	
		RESISTOR	
R1	PD14CY2E105J	Carbon 1MΩ ±5% 1/4W	
R2	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R3,4	PD14CY2E105J	Carbon 1MΩ ±5% 1/4W	
R5	PD14CY2E331J	Carbon 330Ω ±5% 1/4W	
R6	PD14CY2E105J	Carbon 1MΩ ±5% 1/4W	
R7	PD14CY2E333J	Carbon 33kΩ ±5% 1/4W	
R8	PD14CY2E473J	Carbon 47kΩ ±5% 1/4W	
R9	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R10	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R11	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
		SEMICONDUCTOR	
Q1,2		FET 3SK22 (Y)	
Q3,4		Transistor 2SC460 (B)	
D1,2		Diode 1N60	
		COIL	
L1	L32-0166-05	Oscillator coil	
L2,3	L33-0104-05	Ferri inductor 1mH	
L4	L33-0091-05	Ferri inductor 22μH	
L5,6	L33-0104-05	Ferri inductor 1mH	
L7,8	L33-0167-05	Ferri inductor 4.7μH	
		MISCELLANEOUS	
–	X41-1020-00	Gear unit	
–	A01-0169-03	VFO case	
–	B42-0010-04	Nameplate	
–	D22-0011-05	Shaft coupling	
–	E08-0204-05	2P jack	
–	E13-0101-05	1P jack	

Ref. No.	Parts No.	Description	Remarks
–	E22-0207-05	Lug plate	
–	E23-0015-04	Oval lug terminal x 2	
–	E23-0046-04	Wrapping terminal x 4	
–	F07-0231-04	VFO cover	
–	F10-0249-04	VFO shield plate	
–	F11-0010-04	VFO box (G)	
–	J21-0895-03	VFO variable capacitor retainer	
–	J21-1156-03	VFO mounting fitting	
–	J25-0950-04	Printed-circuit board	

AF UNIT (X49-1060-00)

Ref. No.	Parts No.	Description	Remarks
CAPACITOR			
C1	CE04W1H010 (RL)	Electrolytic 1μF 50WV	
C2	CE04W1V4R7 (RL)	Electrolytic 4.7μF 35WV	
C3	CE04W1H010 (RL)	Electrolytic 1μF 50WV	
C4	CE04W1V4R7 (RL)	Electrolytic 4.7μF 35WV	
C5	CE04W1H010 (RL)	Electrolytic 1μF 50WV	
C6	CE04W1V4R7 (RL)	Electrolytic 4.7μF 35WV	
C7	CE04W1HR47 (RL)	Electrolytic 0.47μF 50WV	
C8	CQ93M1H332K	Mylar 0.0033μF ±10%	
C9	CQ93M1H333K	Mylar 0.033μF ±10%	
C10	CQ93M1H153K	Mylar 0.015μF ±10%	
C11	CQ93M1H473K	Mylar 0.047μF ±10%	
C12	CC45SL1H391K	Ceramic 390pF ±10%	
C13	CE04W1H4R7 (RL)	Electrolytic 4.7μF 50WV	
C14,15	CE04W1C100 (RL)	Electrolytic 10μF 16WV	
C16	CE04W1C470 (RL)	Electrolytic 47μF 16WV	
C17	CE04W1V4R7 (RL)	Electrolytic 4.7μF 35WV	
C18	CQ93M1H103K	Mylar 0.01μF ±10%	
C19	CE04W1A470 (RL)	Electrolytic 47μF 10WV	
C20	CE04W1E100 (RL)	Electrolytic 10μF 25WV	
C21	CC45SL1H471K	Ceramic 470pF ±10%	
C22	CE04W1C470 (RL)	Electrolytic 47μF 16WV	
C23	CE04W1C101 (RL)	Electrolytic 100μF 16WV	
C24	CE04W1C330 (RL)	Electrolytic 33μF 16WV	
C25	CE04W1E221 (RL)	Electrolytic 220μF 25WV	
C26,27	CK45F1H403Z	Ceramic 0.04μF +80%,–20%	
C28	CE04W1C330 (RL)	Electrolytic 33μF 16WV	
C29	CK45F1H403Z	Ceramic 0.04μF +80%,–20%	
C30	CK45F1E403Z	Ceramic 0.04μF +80%,–20%	
C31	CK45D1H103M	Ceramic 0.01μF ±20%	
C32	CK4501H102M	Ceramic 0.001μF ±20%	
C33	CK45F1H403Z	Ceramic 0.04μF +80%,–20%	
C34	CC45SL1H101K	Ceramic 100pF ±10%	
RESISTOR			
R1	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R2	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R3,4	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R5	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R6,7	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R8	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R9,10	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R11,12	PD14CY2E562J	Carbon 5.6kΩ ±5% 1/4W	
R13	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R14	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R15	PD14CY2E823J	Carbon 82kΩ ±5% 1/4W	
R16	PD14CY2E222J	Carbon 2.2kΩ ±5% 1/4W	
R17	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R18	PD14CY2E272J	Carbon 2.7Ω ±5% 1/4W	
R19	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R20	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R21	PD14CY2E221J	Carbon 2.2kΩ ±5% 1/4W	
R22	PD14CY2E562K	Carbon 5.6kΩ ±10% 1/4W	
R23	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R24	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R25	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R26	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R27	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R28	PD14CY2E152J	Carbon 1.5kΩ ±5% 1/4W	
R29	PD14CY2E682J	Carbon 6.8kΩ ±5% 1/4W	
R30	PD14CY2E330J	Carbon 33Ω ±5% 1/4W	
R31	PD14CY2E101J	Carbon 100Ω ±5% 1/4W	
R32	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R33,34	R92-0041-25	Metal plate 0.47Ω 1W	
R35	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R36	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
R37	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R38	PD14CY2E270J	Carbon 27Ω ±5% 1/4W	
SEMICONDUCTOR			
Q1,2		Transistor 2SC733 (O)	
Q3		Transistor 2SC373	
Q4		Transistor 2SC734 (Y)	
Q5		Transistor 2SC1061 (A)	
Q6		Transistor 2SA671 (A)	
D1~6		Diode 1S1555	
D7		Diode RV-1	
POTENTIOMETER			
VR1	R12-0048-05	Potentiometer 100Ω (B)	
COIL			
L1,2	L33-0025-05	Choke coil 1μH	
L3	L33-0086-05	Ferri-inductor 1μH	
MISCELLANEOUS			
–	E23-0047-04	Wrapping terminal x 19	
–	F01-0161-04	Heat sink	
–	J25-0948-03	Printed-circuit board	

POWER SUPPLY UNIT (X43-1120-00)

Ref. No.	Parts No.	Description	Remarks
		CAPACITOR	
C1,2	CE02W1V332	Electrolytic 3300μF 35WV	
C3	CE04W1HR47 (RL)	Electrolytic 0.47μF 50WV	
C4	CE04W1H100 (RL)	Electrolytic 10μF 50WV	
C5	CE04W1H47 (RL)	Electrolytic 0.47μF 50WV	
C6	CE04W1V4R7 (RL)	Electrolytic 4.7μF 35WV	
C7	CE02W1E222	Electrolytic 2200μF 25WV	
C8	CE04W1V4R7 (RL)	Electrolytic 4.7μF 35WV	
C9	CE02W1V222	Electrolytic 2200μF 35WV	
C10	CE04W1H010 (RL)	Electrolytic 1μF 50WV	
C11	CE02W1V102	Electrolytic 1000μF 35WV	
C12	CE04W1C471 (RL)	Electrolytic 470μF 16WV	
C13	CK45F1H403Z	Ceramic 0.04μF +80%,−20%	
C14	CC45SL1H391J	Ceramic 390pF ±5%	
C15	CK45F1H403Z	Ceramic 0.04μF +80%,−20%	
C16	CE02W1C102	Electrolytic 1000μF 16WV	
C17	CE02W1E222	Electrolytic 2200μF 25WV	
C18	CE02W1H330 (RL)	Electrolytic 33μF 50WV	
CK1~12	C90-0194-05	Ceramic 0.001μF 500WV	
		RESISTOR	
R1	PD14CY2E221J	Carbon 220Ω ±5% 1/4W	
R2	PD14CY2E222J	Carbon 2.2kΩ ±5% 1/4W	
R3,4	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R5	PD14CY2E681J	Carbon 680Ω ±5% 1/4W	
R6	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R7	PD14CY2E103J	Carbon 10kΩ ±5% 1/4W	
R8	PD14CY2E152J	Carbon 1.5kΩ ±5% 1/4W	
R9	PD14CY2E151J	Carbon 150Ω ±5% 1/4W	
R10	PD14CY2E331J	Carbon 330Ω ±5% 1/4W	
R12	PD14CY2E222J	Carbon 2.2kΩ ±5% 1/4W	
R13,14	PD14CY2E152J	Carbon 1.5kΩ ±5% 1/4W	
R15	PD14CY2E331J	Carbon 330Ω ±5% 1/4W	
R16	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R17	PD14CY2E562J	Carbon 5.6kΩ ±5% 1/4W	
R18	PD14CY2E392J	Carbon 3.9kΩ ±5% 1/4W	
R19	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R20,21	PD14CY2E392J	Carbon 3.9kΩ ±5% 1/4W	
R22	PD14CY2E471J	Carbon 470Ω ±5% 1/4W	
R23	PD14CY2E104J	Carbon 100kΩ ±5% 1/4W	
R24	PD14CY2E472J	Carbon 4.7kΩ ±5% 1/4W	
R25	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R26	PD14CY2E223J	Carbon 22kΩ ±5% 1/4W	
R27	PD14CY2E152J	Carbon 1.5kΩ ±5% 1/4W	
R28	PD14CY2E102J	Carbon 1kΩ ±5% 1/4W	
R29	PD14BY2E101J	Carbon 100Ω ±5% 1/4W	
		SEMICONDUCTOR	
Q1		Transistor 2SC733 (Y)	
Q2		Transistor 2SC734 (Y)	
Q3		Transistor 2SC733 (Y)	
Q4		Transistor 2SD235 (Y)	
Q5		Transistor 2SA495	
Q6		Transistor 2SA671 (B)	
Q7,8		Transistor 2SC733 (Y)	
Q9		Transistor 2SA495	
Q10		Transistor 2SC733 (Y)	
Q11		Integrated circuit MFC4060A	
D1		Rectifier DS-10BN-L	
D2,3		Diode U05B	
D4,5		Diode V06B	
D6		Zener diode WZ061	
D7,8		Diode 1S1555	
D9		Diode 1N60	
D10		Diode V06B	
		POTENTIOMETER	
VR1,2	R12-1012-05	Potentiometer 1kΩ (B)	
		COIL	
L1	L33-0127	Ferri inductor	
		MISCELLANEOUS	
–	E23-0047-04	Wrapping terminal x 24	
–	F01-0167-04	Heat sink (A)	
–	F01-0168-04	Heat sink (B)	
–	F11-0194-03	Power source shield case	
–	F20-0078-05	Insulating mica	
–	J25-0944-13	Printed-circuit board	

SWITCH UNIT (X41-1030-00)

Ref. No.	Parts NO.	Description	Remarks
S2~5	S36-2026-15	Lever switch x 4	
S6	S36-2029-05	Lever switch (non-lock)	
		MISCELLANEOUS	
–	E23-0047-04	Wrapping terminal x 10	
–	J25-0976-04	Printed-circuit board	

DC CORD ASSEMBLY (X42-1050-00)

Ref. NO.	Parts No.	Description	Remarks
		MISCELLANEOUS	
–	E09-0426-05	4P square plug	
–	F05-5022-05	Fuse 5A	
–	J13-0029-05	Fuse holder	
–	J41-0006-00	Cord bushing	

POWER CORD ASSEMBLY (X42-1070-60)

Ref. No.	Parts No.	Description	Re-marks
		MISCELLANEOUS	
–	E03-0301-05	Plug	
–	E09-0426-05	4P square plug	
–	J61-0014-05	Belt	

DISASSEMBLY

(1) Separating upper and lower cases

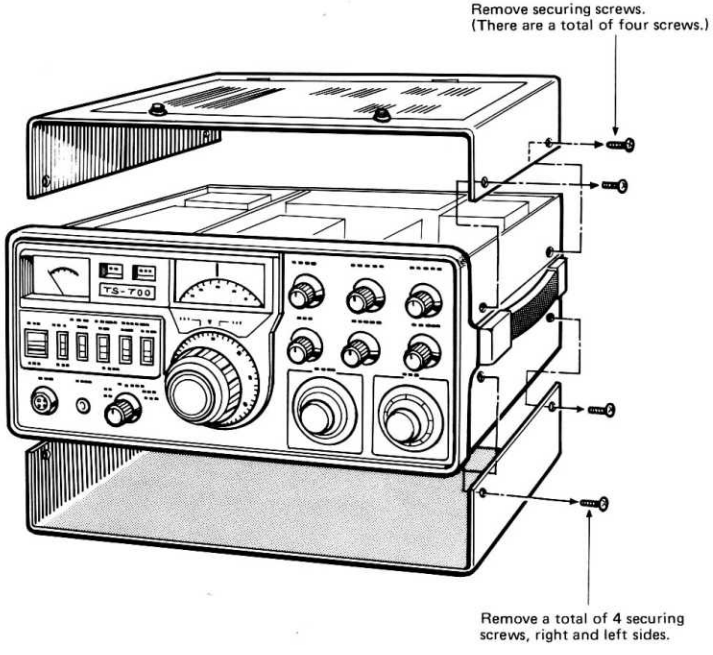
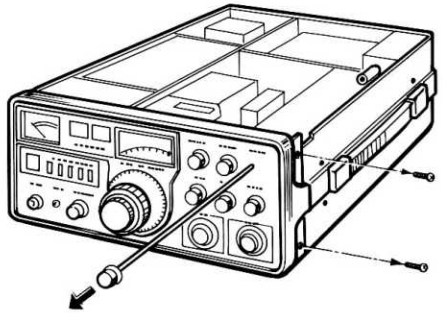


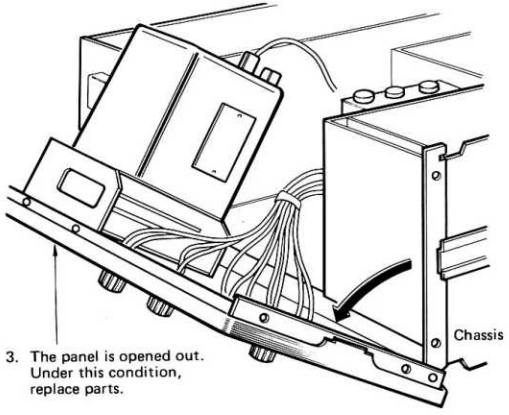
Fig. 1

(2) Opening the panel



1. Draw out FINAL shaft. (Do not remove the knob mounted on the coupling showing up on the side of BPF case.)
2. Remove 4 pan-head screws on both sides of the panel. (Remove alternately to preserve symmetry.)

Fig. 2



3. The panel is opened out. Under this condition, replace parts.

Fig. 3

(3) VFO removal

Procedure

1. Remove double knob on panel. At the same time, remove the dial calibration, spring and knob flange.
2. Remove 4 screws securing the VFO mounting fixtures on top and bottom of panel escutcheons.
3. Remove lamp holder.
   (The holder may be removed first.)

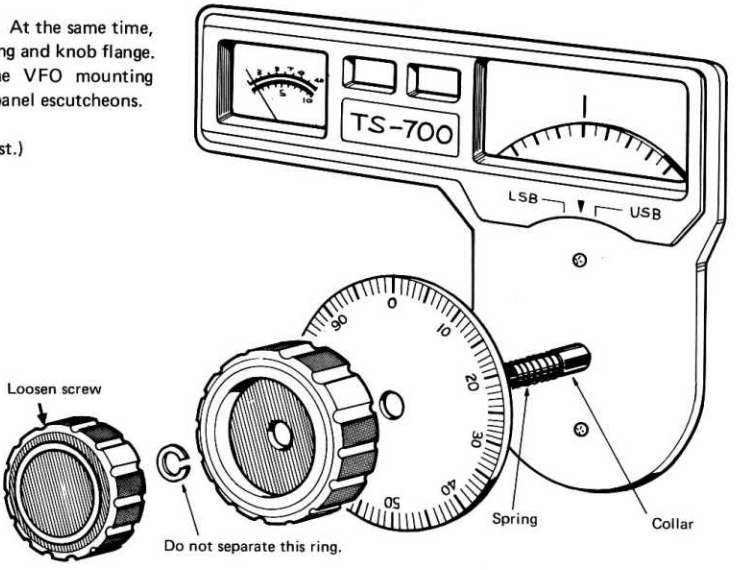


Fig. 4

(4) Dial escutcheon replacement

Remove double knob and knob flange on VFO gear.

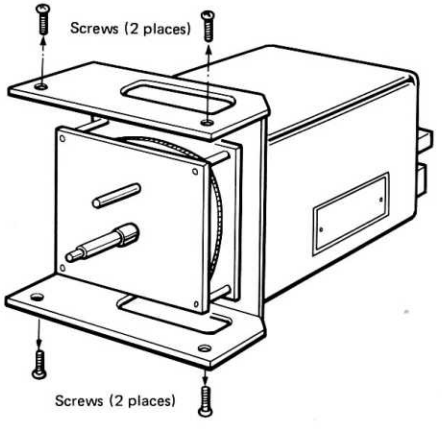


Fig. 5

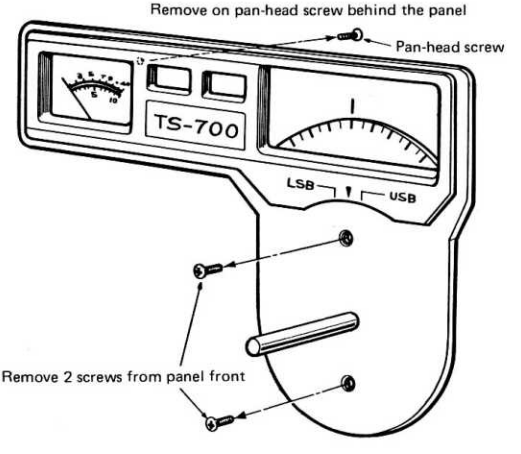
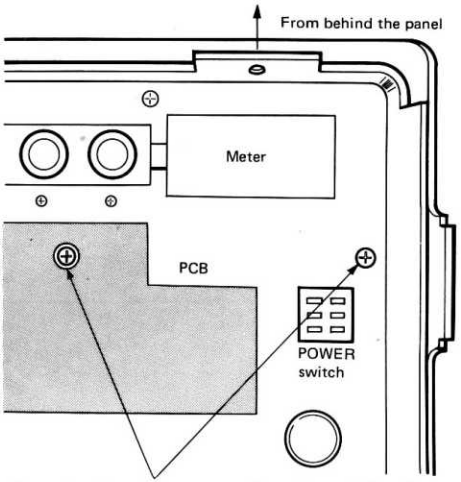


Fig. 6

(5) Replacement of POWER switch and lever switch

5-1 Remove switch grille.
(Have the meter removed beforehand)



Removing these two screws allows the switch grille to come off.

Fig. 7

5-2

Power switch replacement

After removing switch grille, push the switch out to the front by holding down its mounting fingers.

Lever switch replacement

After removing switch grille, remove 4 screws securing the switch to the panel.

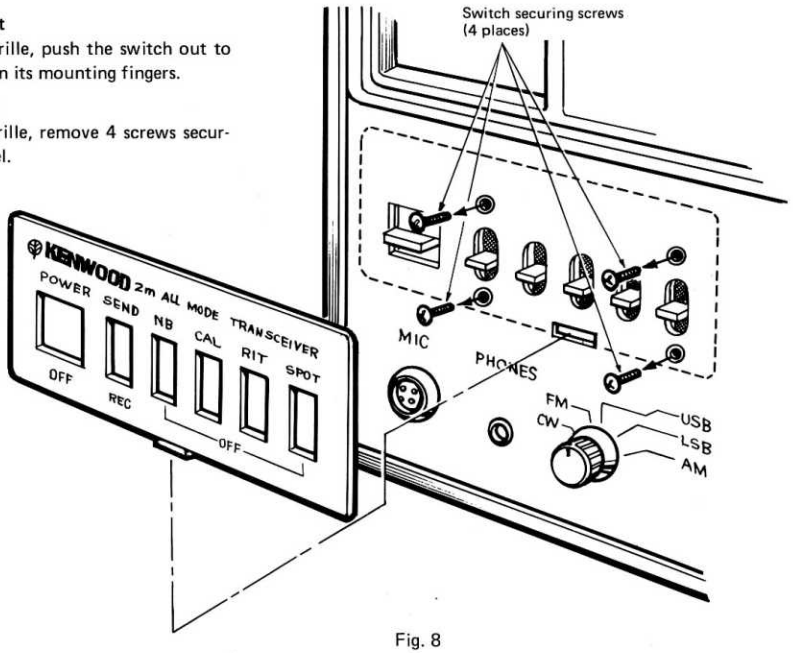


Fig. 8

(6) POWER unit removal

Procedure

1. Remove 4 screws securing the top shield cover.
2. Remove 4 hexagonal bosses.
3. Remove one screw securing the side escutcheon (left as viewed from front side). This screw is at the center of the escutcheon.
4. Remove the power source shield case by pulling it upward.

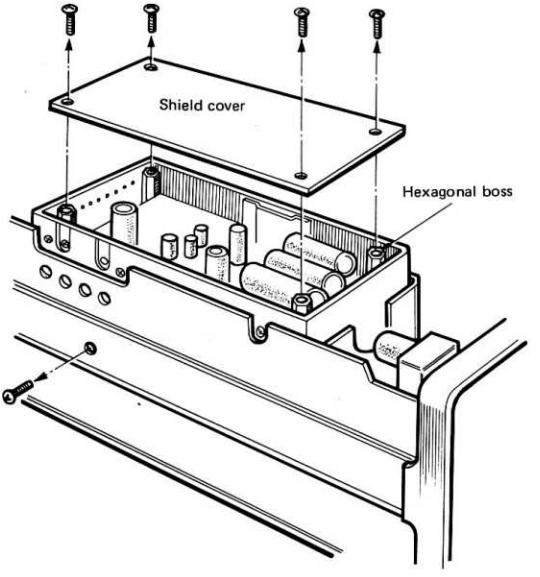


Fig. 9

(7) Replacement of power transformer and rear terminal parts

Remove the separate part of the rear panel. Removing 2 screws on the rear and 2 on the side allows this part to come off.

(8) FINAL unit replacement

Remove 4 screws securing the final-unit heat sink to the rear panel, and pull out FINAL unit.
Parts on the rear panels are to be removed similarly if replacement is required.

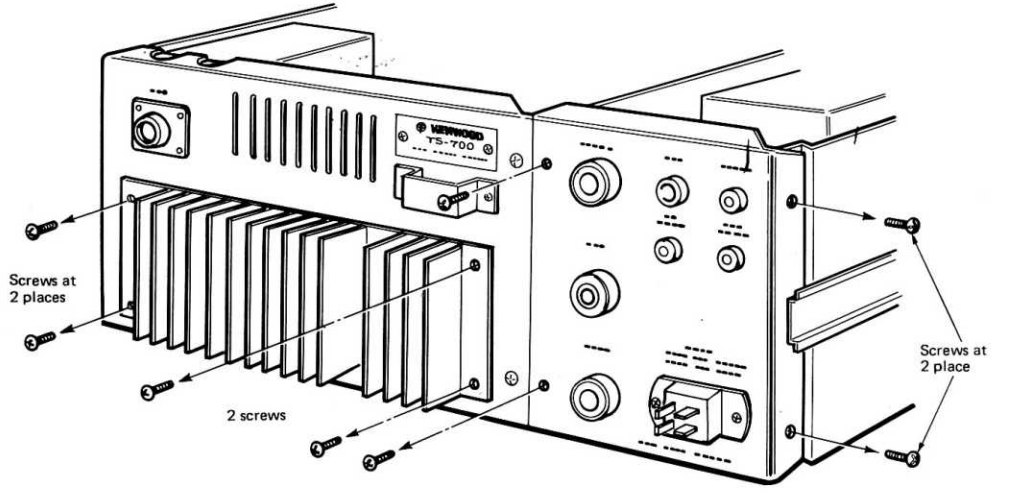


Fig. 10

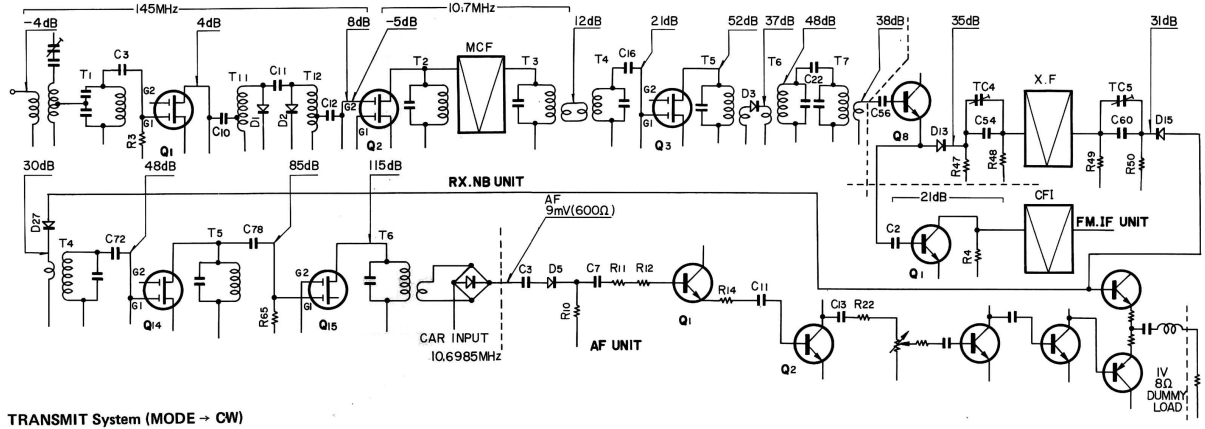
TROUBLESHOOTING

Symptom	Condition	Service Point	Possible Cause	Remedy
1. Turning on the power switch has no effect.		1) Fuse	○ Blown fuse.	○ Replace. Refer to Symptom 2.
		2) Power on-off switch	○ Defective switch.	○ Check. Repair or replace.
		3) Power supply cord	○ Broken cord near the plug end.	○ Check. Repair or replace.
2. Replacement fuse gets blown off in no time.	Power supply fuse (1 A)	1) "B" circuit	○ Circuit faulted to chassis.	○ Check. Repair.
		2) Power supply unit	○ Defective rectifier.	○ Replace.
	20-V circuit (2 A)	1) Final unit	○ Q1 (2N5641) or Q2 (2N5642) is defective.	○ Replace.
		2) AF unit	○ Defective Q5 (2SC1061(A)). ○ Defective Q6 (2SC671(A)).	○ Replace.
3. No signal reception.	Even noise is not heard.	1) AF unit	○ Defective Q5 (2SC1061(A)).	○ Check by disconnecting lead wire from "B" terminal. Replace as necessary.
			○ Defective Q6 (2SC671(A)).	○ Check and, as necessary, replace.
		2) Phone jack	○ Poor contact in the jack.	○ Check for continuity. ○ Repair or replace.
		3) Speaker connector	○ Poor contact.	○ Check for continuity. ○ Repair or replace.
	Noise is heard in all modes.	1) RX NB unit	○ Mixer failure due to defective Q2 (3SK41).	○ Check. Replace Q2.
		2) HET unit	○ Loss of oscillation.	○ Check oscillator voltage. ○ Repair.
			○ Defective rotary switch.	○ Replace.
		3) IF circuit	○ Coil is off adjustment.	○ Re-adjust or replace.
		4) VFO failure	○ Q1 (3SK22), Q2 or Q3 (2SC460) is defective.	○ Check voltage at output and other places. Replace defective transistor.
	Noise is heard on some bands (CW1, SSB, AM).	1) HET unit	○ Defective crystal.	○ Check oscillator voltage. ○ Replace as necessary.
			○ Defective rotary switch.	○ Check and repair or replace.
		2) CARRIER unit	○ T1 is mistuned, or Q1 or Q2 (2SC460(B)) is defective.	○ Check output voltage and adjust T1. Check voltage and replace defective transistor.
	(FM)	1) FM IF unit	○ Defective Q3, Q4 or Q5 (2SC371).	○ Check, re-adjust or replace.
4. Low sensitivity (poor S/N ratio).	On 2 bands	1) AVR unit	○ Stabilized voltage too low.	○ Adjust 9-volt voltage.
		2) RX NB unit	○ Deteriorated Q1 (3 3SK35).	○ Check voltage. Replace.
			○ Deteriorated Q2 (33K41).	○ Check voltage. Replace.
	(FM)	1) FM IF unit	○ Defective CF1 or CF2.	○ Check and replace as necessary.
	(SSB, CW, AM)	1) GEN unit	○ Deteriorated Q14 or Q15 (3SK35).	○ Adjust or replace.
		2) VFO output too low.	○ Trimmer off adjustment.	○ Re-adjust or replace.
			○ Deteriorated Q1 (3SK22).	○ Adjust or replace.
5. "S" meter pointer will not deflect.		1) RX NB unit	○ Improperly set volume.	○ Adjust.
		2) Sensitivity too low.	○ Refer to Symptom 3.	○ Adjust.
		3) GEN unit	○ AGC circuit not operating properly.	○ Check, adjust or replace.
6. Distorted output sound.	In all modes	1) AF unit	○ Defective Q5 (2SC1061) or Q6 (2SA671).	○ Check by disconnecting "B" terminal. Replace as necessary.
	(FM)	1) FM IF unit		○ Check.
		2) RX NB unit	○ Coils off adjustment.	○ Re-adjust.
	(SSB, A1, CW)	1) GEN unit	○ Coil off adjustment.	○ Re-adjust.
		2) RX NB unit	○ Coil off adjustment.	○ Re-adjust.
		3) CAR unit	○ Low output due to frequency deviation.	○ Adjust T1 or TC.

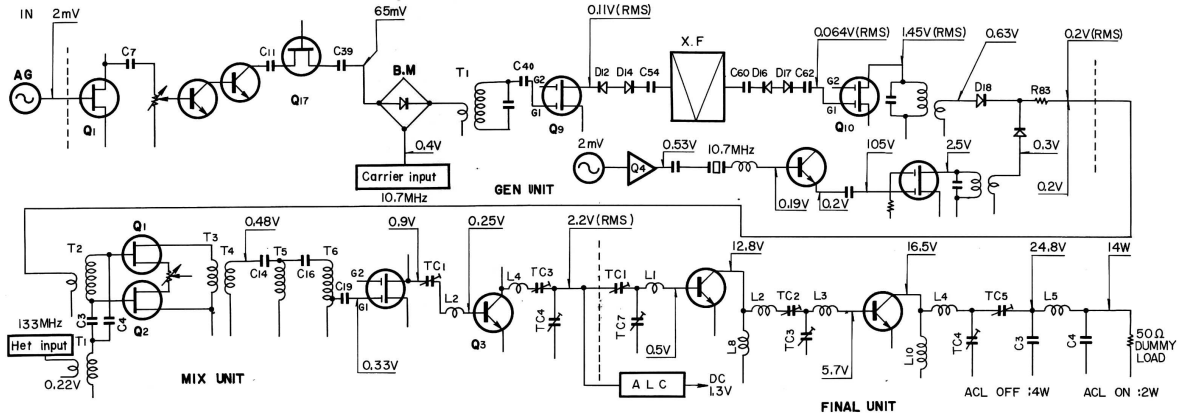
Symptom	Condition	Service Point	Possible Cause	Remedy
7. RIT setting is off zero point.		1) HET unit	○ VR1 off adjustment.	○ Re-adjust.
8. MARKER unit setting is off zero point.		1) MARKER unit	○ TC1 off adjustment or defective crystal.	○ Adjustment or replace.
9. No CW output.	On all bands	1) Check supply voltage.		
		2) Voltage is normal or close to normal level.	○ BPF unit coil is faulted to chassis.	○ Check and repair.
			○ Defective relay contact points.	○ Check for continuity. ○ Replace as necessary.
		3) Voltage is too low or down at zero level.	○ Defective FINAL unit.	
			○ Defective Q1 (2N5641).	○ Check and replace.
			○ Defective Q2 (2N5641).	○ Check and replace.
		4) FM output is normal.	○ Defective GEN unit.	
			○ Defective Q9 or Q10 (3SK35).	○ Check and replace.
			○ Oscillator failure in CARRIER unit, due to:	○ Check the various parts of CARRIER unit.
			○ Defective Q1 or Q2 (2SC460).	○ Check and replace.
			○ Defective crystal oscillator.	○ Check and replace.
	On some bands	1) Failure of heterodyne oscillator.	○ Coil mistuned.	○ Adjust.
			○ Defective crystal.	○ Replace.
		2) FINAL unit	○ Defective BPF unit.	○ Check and repair.
10. Not enough CW output.	On all bands	1) POWER SUPPLY unit	○ Voltage too low.	○ Check 20-volt line.
			○ VFO output too low, or VFO oscillation has failed.	○ Check and repair.
		2) FINAL unit	○ Not enough drive because of defective 2SC998, 2N-5641 or 2N5642.	○ Replace.
		3) HET unit	○ Not enough heterodyne oscillator output.	○ Check output voltage.
		4) GEN unit	○ Coil off adjustment.	○ Re-adjust.
			○ Defective crystal filter.	○ Check the level, and replace as necessary.
			○ Defective Q7 (2SC460).	○ Check voltage. Replace.
			○ Defective Q9 (3SK35).	○ Check voltage. Replace.
			○ Defective Q10 (3SK35).	○ Check voltage. Replace.
		5) BPF unit	○ Coil is faulted to chassis or adjacent part.	○ Check and repair.
11. No SSB output.		1) Microphone	○ Open in the cord, at or near its plug end.	○ Check and repair.
		2) GEN unit	○ Defective Q1 (2SK30), Q2 (2SC373), or Q3 (2SC733).	○ Check voltage. Replace
		3) CAR unit	○ Defective X1 or X2.	○ Check output voltage.
12. No FM output.		1) GEN unit	○ Defective 10.7-MHz crystal.	○ Check. Replace.
			○ Defective Q5 (2SC460) or Q6 (3SK35).	○ Check. Replace.
13. Distorted output sound.	(SSB)	1) Drive knob	○ Out of adjustment.	○ Adjust to obtain maximum output level on CW.
		2) FINAL unit	○ Ruptured capacitor, resulting in abnormal oscillation.	○ Check on CW. Replace as necessary.
	(AM)	1) GEN unit	○ VR1 off adjustment.	○ Re-adjust.
14. Pointer deflection in RF meter is too large or too little.		1) BPF unit	○ Defective diode.	○ Check. Replace.
		2) RX NB unit	○ Volume off adjustment.	○ Re-adjust.

LEVEL DIAGRAM

RECEIVE System (MODE → USB)



TRANSMIT System (MODE → CW)



ADJUSTMENTS

TEST EQUIPMENT

1. **Frequency counter**
   Frequency range: Up to 150 MHz or more
2. **SSG (standard signal generator)**
   Capable of generating frequencies centering on 144 MHz, variable in amplitude, and also of frequency modulation.
   Output voltage: −10 dB ~ 100 dB
   AM: 30% modulation at 1 kHz
   FM: 7.5 kHz (1 kHz)
3. **Oscilloscope**
   High-sensitivity oscilloscope, synchronizable to external sources.
4. **AF Vacuum-tube voltmeter**
   Frequency range: 50 Hz ~ 10 kHz
   Input resistance: 1 megohm minimum
   Voltage range: F.S. = 10 mV up to 30 volts
5. **RF Vaccum-tube voltmeter**
   Frequency range: 150 MHz or more
   For such adjustments not requiring a high degree of precision as those on CARRIER unit and HET unit, a test circuit arranged as shown in Fig. 11, with a circuit tester, may be used as a substitute.

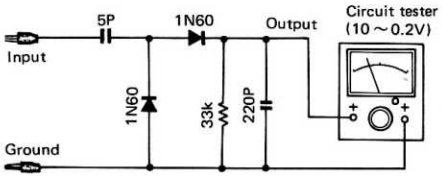


Fig. 11

6. **Vacuum-tube voltmeter**
   Input impedance: 10 megohms or more
   Voltage range: F.S. = 1.5 up to 1000 volts, AC and DC.
   A circuit tester (25 K/V, DC) may be substituted for this voltmeter to check voltage on low-impedance circuits. Generally, a circuit tester does not provide accurate voltage readings on high-impedance circuits.
7. **Power meter**
   Capable of measuring up to 20 watts, 150 MHz. Imput impedance of the meter should be 50 ohms.
8. **Linear detector**
   Frequency range: 150 MHz or more
   Frequency deviations: 20 kHz or more
   The detector need not be used where high accuracy of measurement is not required.
9. **AG (audio generator)**
   Output frequencies: 300 Hz ~ 10 kHz
   Output voltage: 1 volt minimum
10. **AF Dummy load**
    8 ohms and 3 watts approximately.

GENERAL INFORMATION

1. Have the controls positioned according to Table 1; keep them in the indicated positions at all times unless otherwise instructed in the procedure.

Control	Position
POWER SWITCH	ON
STANDBY SWITCH	REC
NB SWITCH	OFF
CAL SWITCH	OFF
RIT SWITCH	OFF
SPOT SWITCH	OFF
FIX. CH SWITCH	VFO
RF GAIN	Clockwise end
AF CAIN	Counterclokwise end
SQUELCH	Counterclockwise end

Table 1

2. For the adjusting tools to be used on such as trimmers, a rod made of an insulating material such as bakelite should be made available.
3. When carrying out an adjustment on the receiving section with the use of the SS generator, be careful not to turn STBY switch to "SEND" position. This precaution is for protection of the SSG. The safest way is to have the 9-pin plug at the rear face pulled off.
4. When adjusting on the transmitting section, have the power meter connected to this section: this is for protection of the transistors in the final stage.

ADJUSTMENT OF POWER SUPPLY UNIT (X43-1120-00)

Adjust the voltage to the values indicated in Table 2 by referring to Fig. 12. First to be set right is VR1; adjusting this variable resistor will affect VR2. So, be sure to adjust VR2 too after adjusting VR1.

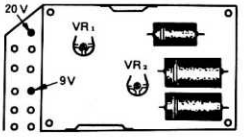


Fig. 12

Terminal	ADJ	DC voltage
9	VR1	9V ±0.1V
20	VR2	21V $\pm^{0V}_{1V}$

Table 2

ADJUSTMENT OF CARRIER UNIT (X50-1160-00)

Hook up the instruments (frequency counter and RF vacuum-tube voltmeter) as shown in Fig. 13, and adjust to obtain the target values listed in Table 3. When adjusting TC3 (for CW), be sure to have the fixed channel empty. Adjustment with TC1 and TC2 here is tentative; final setting is to be effected according to 7. CARRIER POSITION ADJUSTMENT in **ADJUSTMENTS ON TRANSMITTING SECTION.**

MODE	STBY	ADJ	OUTPUT RF VOLTAGE OR FREQUENCY
USB	REC	T 1	Maximum RF voltage
USB	REC	TC1	10.6985 MHz
LSB	REC	TC2	10.7015 MHz
C W	SEND	TC3	10.7006 MHz

Table 3

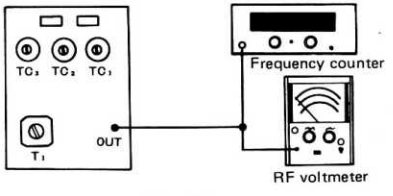


Fig. 13

ADJUSTMENT OF VFO UNIT (X40-1080-00)

Refer to Fig. 14 and Table 4. The dial position "1000" (Table 4) is reached by turning the main dial clockwise and backing it away by one rotation from the stopper point. One rotation corresponds to an interval of 25 kHz.

Connect the frequency counter to VFO terminal of HET unit. The location of this terminal is indicated in Fig. 15.

DIAL	ADJ	OUTPUT FREQUENCY
0	L1	8.200 MHz
1000	TC1	9.200 MHz

Table 4

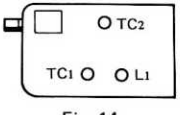


Fig. 14

ADJUSTMENT OF HET UNIT (X50-1170-61)

Connect the RF vacuum-tube voltmeter and frequency counter to the HET unit as shown in Fig. 15. With RIT control accurately positioned at "0", the dial at "0" position and VR2 set at its neutral position, adjust according to Table 5.

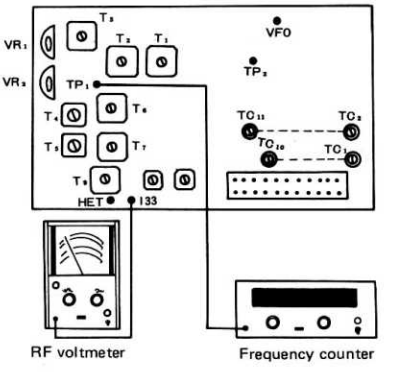


Fig. 15

Sequence	BAND SW	RIT SW	ADJ	Output RF voltage or frequency
(6)	145	OFF	T.4,5,6, 7 and 9	Maximized RF voltage
(1)	144	ON	L2	125.100 MHz
(2)	144	OFF	VR1	125.100 MHz
(3)	145	OFF	L3	126.100 MHz
(4)	Connect RF voltmeter to TP1; adjust T1 to maximize output voltage at 126.100 MHz; and adjust T2 in such a way that the output voltage at 125.100 MHz will come to within 1 dB of the voltage level already obtained at 126.1 MHz: try to minimize the difference between the two voltage levels.			
(5)	Adjust T3 to maximize the RF voltage applying to the gate of Q6 (2SK19) or Q7, with VFO set at "500" on the graduated scale. So that the RF voltmeter pointer will not deflect beyond the 1.3-V point at this time, adjust the TC2 on VFO unit (Fig. 14).			

Table 5

Note:

When adjusting L2, VR1 or L3, make sure that the VFO output voltage is not applying to the VFO terminal. This can be accomplished by having the FIX CH switch turned to an empty channel position. Be sure to have VR2 set at its neutral position.

ADJUSTMENT OF FIXED CHANNEL

With the frequency counter connected to TP2 (Fig. 15), adjust each trimmer for a fixed channel to obtain the target value indicated in Table 6. There are a total of 11 trimmers, TC1 through TC11, inclusive.

Band 1 (144)	Band 2 (145)	(AM,FM, CW) fo (MHz)	fUSB	fLSB
– *144.00	17 145.00	8.200		
– 144.04	18 145.04	8.240		
– 144.08	19 145.08	8.280		
– 144.12	20 145.12	8.320	8.3215	8.3185
– 144.14	– 145.14	–	8.3415	8.3385
– 144.15	– 145.15	–	8.3515	8.3485
– 144.16	21 145.16	8.360	8.3615	8.4585
– 144.20	22 145.20	8.400	8.4015	8.4985
– 144.24	23 145.24	8.440	8.4415	8.5385
– 144.28	24 145.28	8.480	8.4815	8.5785
– 144.32	25 145.32	8.520	8.5215	8.5185
1 144.36	26 145.36	8.560	8.5615	8.6585
2 144.40	27 145.40	8.600	8.6015	8.5885
3 144.44	28 145.44	8.640	8.6415	8.6385
4 144.48	– 145.48	8.680	8.6815	8.6785
5 144.52	145.52	8.720		
6 144.56	– 145.56	8.760		
7 144.60	– 145.60	8.800		
8 144.64	– 145.64	8.840		
9 144.68	– 145.68	8.880		
10 144.72	– 145.72	8.920		
11 144.76	– 145.76	8.960		
12 144.80	– 145.80	9.000		
13 144.84	– 145.84	9.040		
14 144.88	– 145.88	9.080		
15 144.92	– 145.92	9.120		
16 144.96	– 145.96	9.160		
17 145.00	– 146.00	9.200		

* IMPORTANT: Not to be sent out on air.

Table 6

ADJUSTMENT OF THE RECEIVING SECTION

1. AF unit (X49-1060-00)

With the circuit tester connected as shown in Fig. 16, adjust VR1 to read 22 mA ±2 mA on the tester.

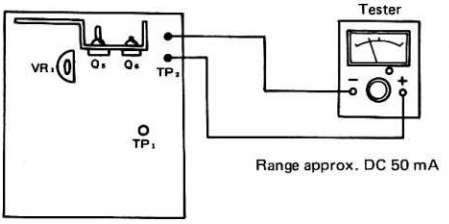


Fig. 16

2. Adjusting procedure for AM reception

Instruments are to be connected as shown in Fig. 17.
Have controls set as follows:
MODE: AM
DRIVE: 12 o'clock position sharp (145)
BAND: 145
DIAL: "O"
AF GAIN:
Adjust, from time to time, to read about 0.63 volt on the AF vacuum-tube voltmeter.

1) Set TC1 and TC2 (of RX NB unit) to (half capacitance) position.
2) Adjust the SS generator to produce a 145.0 MHz signal at a level anywhere between 10 and 20 dB and feed this signal into the transceiver through its antenna terminal, as shown. Throttle down the SSG output gradually until AGC disappears. Adjust T4, T5 and T6 (of the GEN unit, Fig. 19), T1, T2, T3, T4, T5, T7, T11 and T12 (of the RX NB unit, Fig. 18) in such a way that the pointer of the AF vacuum-tube voltmeter will deflect to the farthest possible position on the scale. Hold the SSG output always at such a level as will not cause the "S" meter pointer to deflect
3) Adjust TC1 and TC2 (of the RX NB voltmeter) just a little to maximize the deflection of the AF voltmeter pointer.

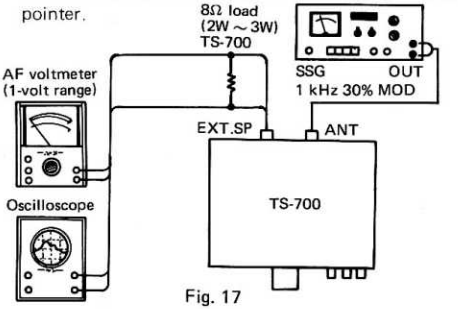


Fig. 17

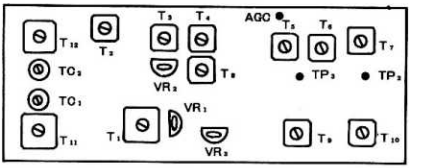


Fig. 18

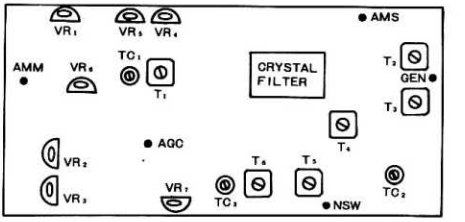


Fig. 19

3. Noise blanker (NB)
   1) Connect the vacuum-tube voltmeter to TP3 (Fig. 18).
   2) Set the SSG output (unmodulated) to 40 dB, and feed this output signal (145 MHz) into the transceiver set to receive on USB mode.
   3) Minimize the DC voltage at TP3 by adjusting T8, T9 and T10 (Fig. 18).

4 "S meter
   1) Adjust VR2 (Fig. 18) to make the pointer of this meter stay at "O" on the scale in the condition of non-reception of the signal.
   2) Set the SSG output (unmodulated) to 20 dB, 145 MHz, and feed this signal into the transceiver set to receive on USB mode.
   3) Adjust VR1 (Fig. 18) to deflect the meter pointer to "9". Repeat the process, steps 1) to 3), two or three times.

5. Adjusting procedure for SSB reception (CARRIER balancing)
   1) Receive a 145-MHz signal, not modulated, delivered at 30 dB by the SSG. Have the transceiver set for USB or LSB mode of reception.
   2) Adjust VR7 and TC3 (Fig. 19) to minimize and equalize the "S" meter deflection for the two sideband signals, USB and LSB.

6. Adjusting procedure for FM reception
   1) Connect the vacuum-tube voltmeter to TP2 (Fig. 20).
   2) Referring to Fig. 17, feed the SSG output of 145 MHz, not modulated, at 30 dB into the transceiver set for FM mode reception. The input level should be such that the pointer of "S" meter will swing to and stay at the middle position on the scale.
   3) Change the SSG output signal, making it exhibit a frequency deviation of 1 kHz or 7.5 kHz. Adjust T1 and T2 (Fig. 20) to obtain the best possible waveform display and to maximize the FM output in each case of frequency deviation.

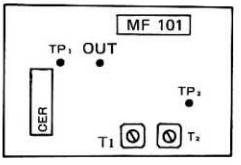


Fig. 20

7. MARKER unit (X50-1200-00)
   Connect the frequency counter as shown in Fig. 21. With CAL control set in ON position, adjust TC1 to read 1 MHz ±20 Hz on the counter. (If the pointer of the counter will not deflect adequately, the counter input may be taken from TP1.)

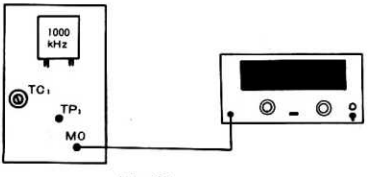


Fig. 21

8. RIT setting
   1) Have controls set as follows:
      MODE: USB
      CAL switch: ON
      RIT: O (Set sharp to this position.)
      RIT switch: ON
      Feed the marker signal (beat signal) into the transceiver.
   2) Adjust VR1 (of the GEN unit, Fig. 15) in such a way that turning off the RIT switch will not affect the beat sound.

9. Main dial
   (For more accurate adjustment, refer to Adjustment on VFO unit, page 46.)
   1) Start with the following control settings:
      MODE: USB
      MAIN DIAL: (As shown in Fig. 22)
      CAL switch: ON
   2) Receive the marker signal. Adjust L1 in such a way that "zero" beat will occur with the sub-dial brought to "O" position.
   3) With the sub-dial set in "1000" position, adjust TC1. Repeat the process, steps 1) through 3), several times.

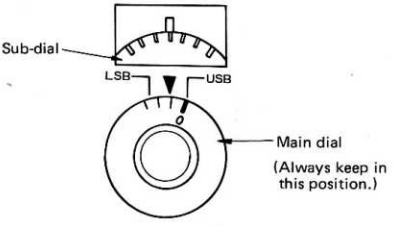


Fig. 22

ADJUSTMENT OF THE TRANSMITTING SECTION

1. MIX unit (X48-1080-00)
   1) Connect the power meter to ANT terminal of the transceiver.
   2) Have controls set as follows:
      BAND: 145
      DRIVE: 12 o'clock (145)
      MODE: FM
      MAIN DIAL: O
      VR1: Center
      STBY: SEND
      VR8 (for ALC): Clockwise end
      Have the RF voltmeter connected as shown in Fig. 23. Adjust T1, T2, T3, T4, T5, T6, TC1, TC2, TC3 and TC4 are here tentative; these are to be adjusted finally when adjusting the FINAL unit.
   3) Leave VR1 set in its approximately middle position.

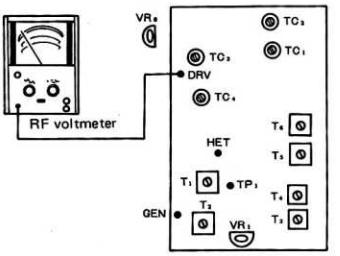


Fig. 23

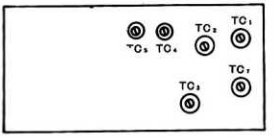


Fig. 24

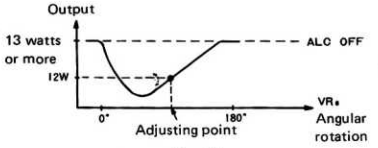


Fig. 25

2. FINAL unit (X56-1140-00)
   1) Connect the power meter to ANT terminal.
   2) Have controls set as follows:
      BAND: 145
      DRIVE: 12 o'clock (145)
      MODE: FM
      MAIN DIAL: 0
      ALC (VR8): OFF
      STBY: SEND
   3) Adjust TC1, TC2, TC3, TC4, TC5 and TC7, shown in Fig. 24, and also TC3 and TC4, shown in Fig. 23, to obtain the largest possible output. (Repeat the foregoing sequence several times, each time adjusting the FINAL control to maximize the output.)
3. ALC adjustment

   Note:

   This adjustment is to be carried out when the GEN unit, MIX unit and FINAL unit have all been adjusted.

   Rotate VR8 (located on the side lag plate of the MIX unit) to its counterclockwise end position; this turns off ALC. Under this condition, check to be sure that an output of at least 13 watts is available. Then reduce the output to 12 watts by adjusting VR8. (Make sur that the ALC voltage is capable of changing between 4 volts and 1.0 volt.)
4. RF meter
   1) With the transceiver set for FM mode transmission, maximize its output.
   2) Adjust VR3 (Fig. 18) in such a way that the RF meter pointer will deflect to "7" (S9 position).
5. Adjusting procedure for FM transmission
   1) Referring to Fig. 19, connect the frequency counter and RF vacuum-tube voltmeter to the GEN terminal.
   2) With MODE in FM position and STANDBY (STBY) in SEND position, adjust T3 (Fig. 19) to maximize the RF output voltage.
   3) Adjust TC2 (Fig. 19) to obtain a frequency of 10.700 MHz.
   4) Referring to Fig. 26, adjust to obtain an AG output of 2 mV and 1.5 kHz.
   5) Turn FM-MIC-GAIN clockwise all the way in order to obtain the largest possible output.
   6) If the frequency deviation is noted to be too narrow, enlarge it to 5 kHz by adjusting VR3 (Fig. 19).

   Note:

   Where the linear detector is not available a monitoring receiver may be substituted for it. With such a receiver, the first step is to connect the SSG to it to feed an SSG output with a frequency deviation of 10 kHz or 5 kHz; then read the receiver output for reference. The next step is to replace the SSG by the TS-700 transceiver being adjusted and change its VR2 or VR3 in such a way that the monitoring receiver will give an output reading equal in value to the first reading.

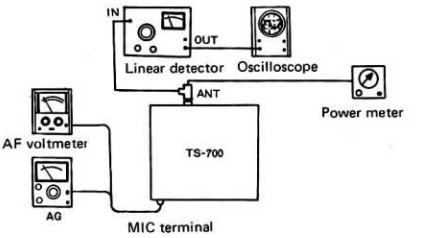


Fig. 26

   7) Leave FM-MIC-GAIN-VR turned clockwise.
6. Adjusting procedure for CW and AM transmission
   1) Connect the RF voltmeter to the GEN terminal shown in Fig. 19.
   2) With MODE set in CW position and STBY in SEND position, adjust T1 and T2 (Fig. 19) to maximize the RF voltage as read on the voltmeter.
   3) With BAND set in "145" position and MAIN DIAL in "0" position on the scale, maximize the RF output level.

4) Adjust VR5 (Fig. 19) to obtain the same output level as the FM output level previously noted.
5) With MODE left in AM position, adjust VR4 (Fig. 19) to obtain a 145-MHz output of 5 watts.
6) Turn SSB-MIC-GAIN closkwise all the way. As shown in Fig. 26, connect the AF vacuum-tube voltmeter and audio generator (AG) to the MIC terminal.
7) Supply a 1.5-kHz AG output of 2 mV, and adjust VR1 (Fig. 19) so that an AF voltage of 200 V will be read at the AMM terminal (Fig. 19).
8) With the 1.5-kHz AG output of 2 mV kept supplied, adjust SSB-MIC-GAIN control in such a way that an output of 260 mV will be read at the D terminal of Q17 (2SK30).

7. Adjustment of CARRIER position
1) Produce the largest possible output, with MODE set in CW position, BAND in "145" position and MAIN DIAL at "0" position.
2) With the transceiver set for USB mode transmission, adjust TC1 (of the GEN unit) in such a way that 400-Hz output and 2600-Hz output will both be about 5 watts, the difference being not greater than 1 watt.
3) With MODE set in LSB, adjust TC2 in the same way.
4) At SPOT position, be sure that the output is 3 watts or above with USB and LSB MODE.

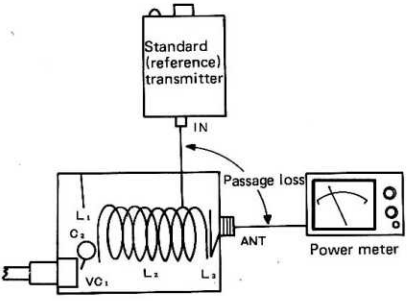


Fig. 27

8. CARRIER balancing
1) With MODE in CW position, produce the largest possible output.
2) Switch MODE to USB or LSB position. Connect the RF voltmeter to the ANT terminal.
3) Adjust TC1 and VR6 (Fig. 19) in such a way as to minimize and equalize the RF voltage read on the voltmeter for USB and LSB modes of transmission.

9. Adjustment of the tone generator
1) Connect the VTVM to "OUT" (Fig. 20) terminal on the FM-IF unit (X48-1070-61).
2) Turn the TONE switch on and adjust the potentiometer VR101 (100 kΩ) on the FM-IF unit (X48-1070-61) so that the VTVM indicates 5mV.

ADJUSTMENT ON BPF UNIT (X51-1090-00)

This adjustment is to be effected with a standard transmitter (such as TR-7200G) connected as shown in Fig. 27. The standard transmitter is assumed to have been accurately calibrated and adjusted to produce a 145.0-MHz output of about 10 watts at 50 ohms.

1) Referring to Fig. 27, have FINAL set in "145" position.
2) Reduce the distance between L2 and L3 as much as possible.
3) Adjust C2 position and L2 spacing so that the passage loss will be less than 10%, that is, will not exceed 1 watt where the standard transmitter, mentioned above, is used in the hook-up illustrated in Fig. 27.

SCHEMATIC DIAGRAM

* —— Signal flow
---- Control, OSC, common flow

* —— +20V DC, +9V DC
---- –6V DC
* ( ) shows the levels for transmission.
* ■ shows TEST POINT.

2SC460B
2SC458

2SC371
2SC373
2SC388A
2SC733
2SC734
2SC735
2SA495

2SC998

2SA671
2SC1061
2SD235

2SK19

2SK30

2SK22

3SK35

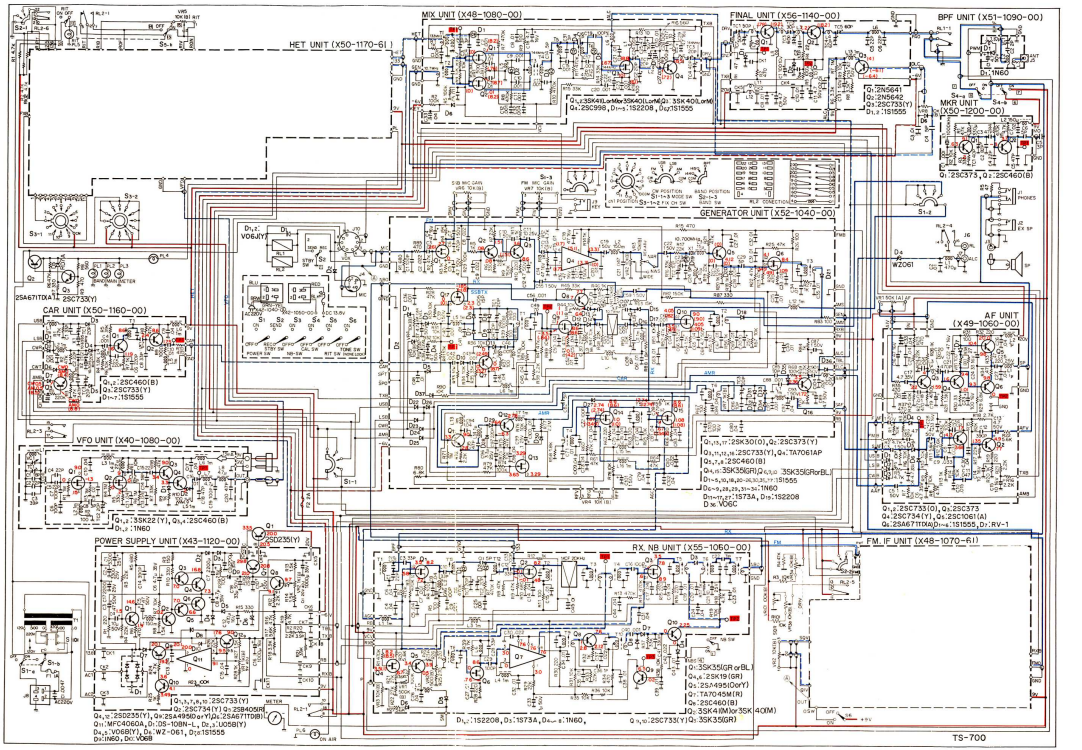
TA-7045

MFC4060A

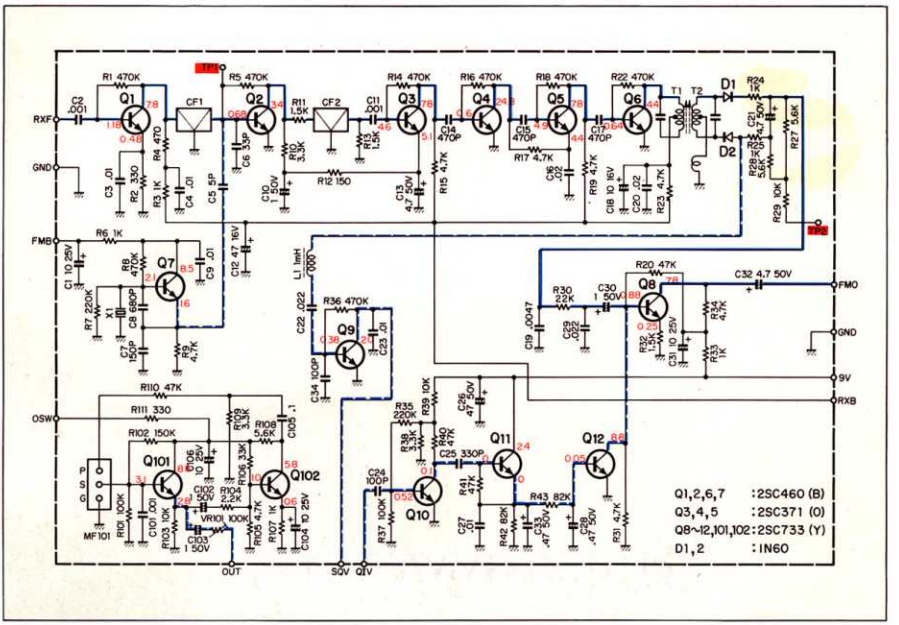
TA7061AP

2N5641

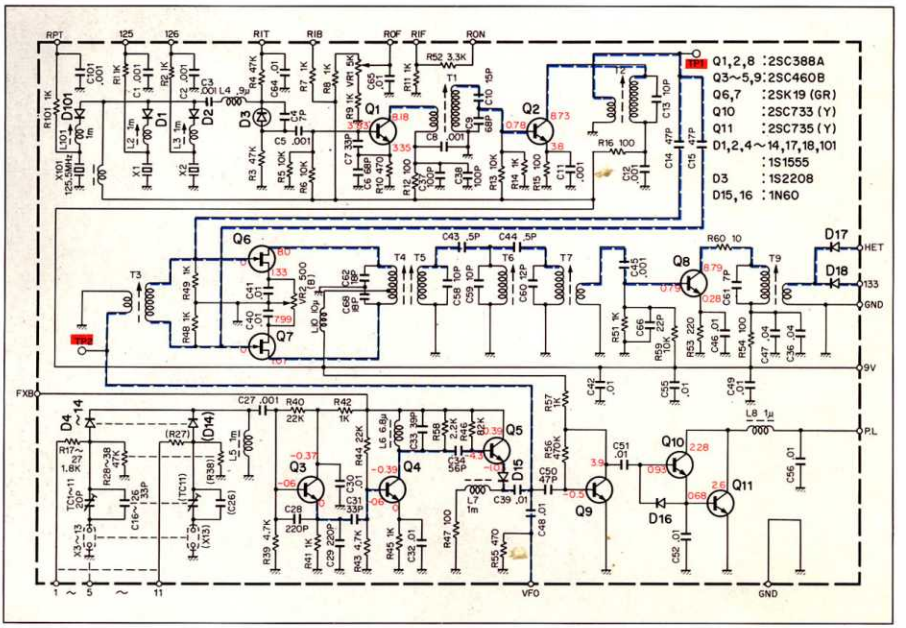
2N5642



FM-IF UNIT (X48-1070-61)



HET UNIT (X50-1170-61)



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