STANDARD®

C58

ALL MODE TRANSCEIVER

INSTRUCTION / MANUAL

STANDARD COMMUNICATIONS CORP.

INSTRUCTION MANUAL SECTION

We are confident that you will be entirely satisfied with your 144 MHz band all-mode Transceiver Model C58. Our very strict quality control and inspection ensure that each transceiver unit leaves the factory in perfect condition. If the unit is damaged or fails to operate properly, immediately contact your dealer.

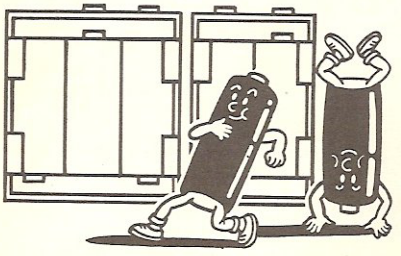
To obtain the best performance and longest use from your transceiver, study these instructions carefully.

ACCESSORIES

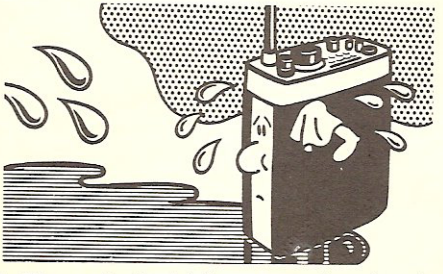
- Hand-held microphone with UP-DOWN switch (MP-716) 1
- Helical antenna 1
- Shoulder belt 1
- External power plug 1
- Instruction manual 1
- Schematic diagram 1

1. PRECAUTIONS

- **Note the following precautions before use.**



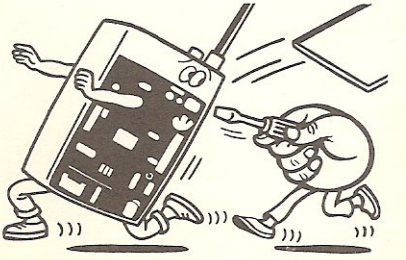
1. When inserting battery packs in the unit, check that their polarity is correct.



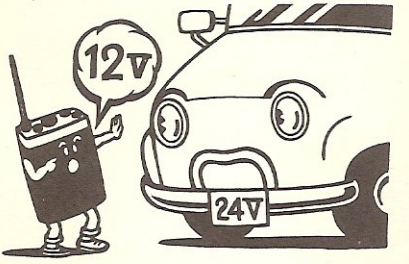
3. The unit should be operated under the circumstance where it will not be subject to temperature or humidity extreme or excessive dusts.

2. FEATURES

1. The compact, high-performance model provides all-mode operations including FM, SSB (USB and LSB) and CW on the two-meter band (144 MHz).
2. Superior operability is achieved by microprocessor control associated with large-capacity storage.
3. 4 VFO is incorporated, providing 100 Hz frequency stepping.
4. The front-end section of the unit uses a N channel cascade MOS FET, which achieves high sensitivity and signal-to-noise ratio.
5. The three-pole helical resonator improves intermodulation rejection.
6. The multi-purpose LCD (liquid crystal display) provides clear numerical frequency readout even under the direct sunlight.
7. Hand-held microphone with channel UP/DOWN switch.
8. RIT, NB and side-tone circuits incorporated.
9. A new built-in 1750 Hz tone burst generator is provided for driving in repeater operation.
10. A variety of options are available. Combined with a linear amplifier and mobile bracket, the unit provides 25-watt mobile operation. operation.



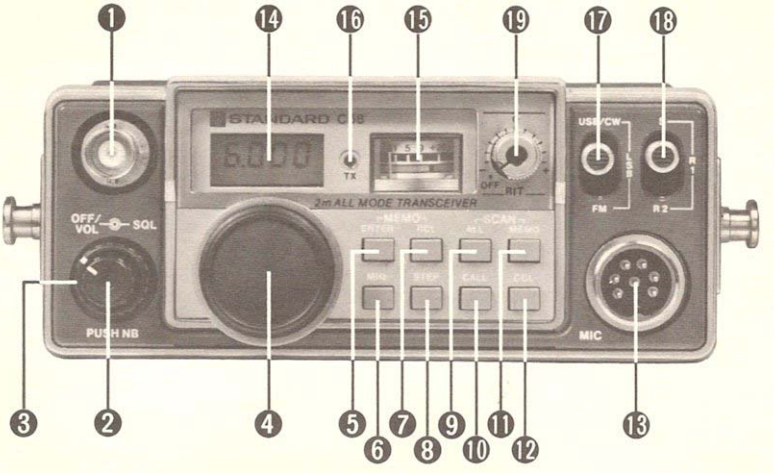
2. The coil slugs and trimmer capacitors in your unit are factory adjusted. Do not try re-adjustment.



4. The unit operates on +12 VDC battery power. Large vehicles usually use a +24 VDC battery source, which is not usable for powering the unit.

3. PANEL FEATURES

■ FRONT PANEL FEATURES



❶ BNC CONNECTOR
This connector accepts the supplied helical antenna for portable operation.

❷ POWER/VOLUME/PUSH N.B
This knob serves to tripple purpose: a power switch, volume control, and noise blanker (N.B) on/off switch. When the knob is turned fully counterclockwise, the power to the unit is turned off.
To apply power to the transceiver, rotate the knob clockwise beyond the detent OFF position; further clockwise rotation of the OFF/VOL control will increase output volume level.
Each depression of the OFF/VOL control knob turns on and off the noise blanker function alternately. When the noise blanker is on, a dot appears at the top-right corner of the LCD display.
(NOTE: The N.B functions in the SSB or CW mode only, not in the FM mode.)
When the unit is powered from built-in batteries, the internal memory is backed up by them even if the OFF/VOL control is set at OFF. The back-up current is approximately 40 μA.

❸ SQL (SQUELCH) CONTROL
The SQL control is used to suppress annoying FM background noise heard when no input signal is present. Set this control at a point where background noise just disappears. The SQL circuitry acts only in FM mode.

❹ TUNING CONTROL
This digital VFO control knob is used to tune in the desired operation channel frequency. While this knob is turned in either direction, tuning frequency steps up or down at the specified stepping intervals.
This rotary-switch control permits free rotation, allowing for skipping from the top to bottom or bottom to top channel frequencies.

❺ MEMO ENTRY KEY
Press this key to store the selected channel frequency in the memory. The memory can store up to 5 frequency data of FM, SSB and CW modes.

❻ MHz
This key switch is used to select a desired transmission/reception frequency band from among 144, 145, 146, and 147 MHz bands. Depressing the key can raise continually the frequency band upward in steps of 1 MHz starting with the 144 MHz band.

❼ MEMO RCL KEY
This key is used to recall stored channel frequencies. Each time it is pressed, frequency data stored in memory addresses M1 ~ M5. The recalled memory address is displayed at the bottom of the frequency readout along with memory mark "M".

⑧ STEP

This key selects channel frequency stepping interval from 5/25 kHz, 1 kHz and 100 Hz. Frequency readouts for each stepping interval are as follows:

In the stepping of 5/25 kHz intervals, the readout shows the frequency in four figures, the least significant digit of which represents that of 1 kHz. The 0.5 kHz is indicated by a dot at the lower right of the readout. In the stepping of 1 kHz intervals, two dots appear at the left of the readout. The least significant digit indicates that of 1 kHz. In the stepping of 100 Hz intervals, the least significant digit indicates that of 100 Hz. The MHz's indication is given by a dot(s) at the left of the readout. One dot represents 144 and 146 MHz's frequencies and two dots are 145 and 147 MHz's frequencies.

⑨ SCAN ALL KEY

This key, when depressed, scans up over the currently-selected MHz band in 100 Hz, 1 kHz, 5 kHz or 25 kHz steps.

⑩ CALL

Press this key to transmit a tone burst signal for repeater driving (tone frequency: 1750Hz).

⑪ SCAN MEMO

When this key is depressed, channel frequencies stored in the memory are sequentially scanned from M1.

⑫ CCL KEY

This key is used to initialize all the unit's operation mode of the unit.

⑬ MIC JACK

This jack accepts the supplied microphone.

⑭ FREQUENCY AND MODE DISPLAY

This LCD readout provides frequency and mode display such as SCAN, MEMO, and N.B.

⑮ METER

The meter checks input signal strength (S), transmission power (RF) and battery voltage. The meter is switched automatically between S and RF as the unit is switched from the reception to transmission mode. When you wish to check battery voltage with the meter, set the rear slide switch to the BAT CHECK position.

⑯ TX INDICATOR

This goes on when the unit is set up for the transmission mode.

⑰ MODE

This switch selects operation mode from USB, LSB, and FM. The USB position is shared by the CW mode.

⑱ RPT SWITCH

This switch can select either of the simplex, repeater R1, or R2 mode of operation.

S mode: For ordinary simplex operation.

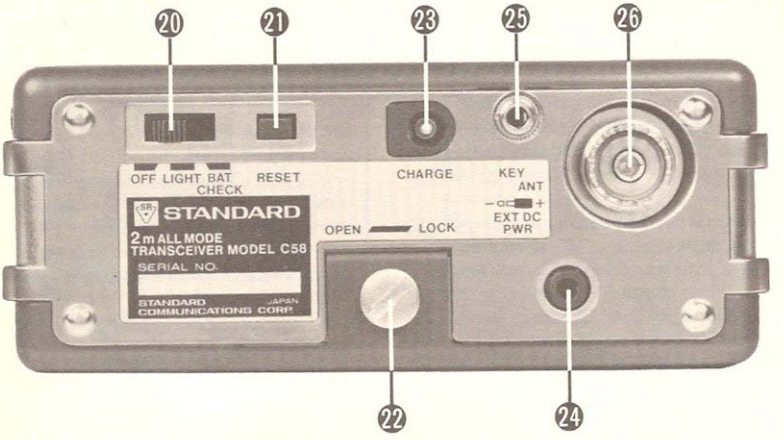
R1 mode: Shifts the reception frequency upward by 600 kHz from that of the simplex operation.

R2 mode: Shifts the transmission frequency upward by 600 kHz from that of the simplex operation.

⑲ RIT

This control adjusts receiver's tuning frequency without changing transmission frequency. The frequency obtained in the center position (0) of this control corresponds to that at the RIT-OFF position. The RIT control is effective in all operation modes.

■ REAR PANEL FEATURES



⑳ LIGHT/BAT CHECK SWITCH

In the LIGHT position, the LCD and meter lamps glow. The BAT CHECK position causes the front meter to function as a battery voltage indicator while all the lamps are left on. The OFF position turns off all lamps.

㉑ RESET SWITCH

This pushswitch, when depressed, resets the internal microprocessor to its initial state. If microprocessor error takes place due to chattering, ect., depress this button.

㉒ BATTERY COMPARTMENT COVER RETENTION SCREW

To open the battery compartment cover, loosen this screw with a coin.

㉓ CHARGE SOCKET

This socket accepts a Ni-Cad battery charger (see Fig. 2).

㉔ EXT. PWR SOCKET

This socket accepts an external DC power-source supplied via the DC adaptor supplied with the unit. See Fig. 7.

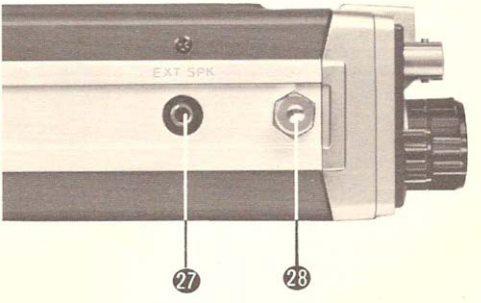
㉕ KEY

This terminal accepts a CW key with a 3.5 mm plug.

㉖ ANT RECEPTALCE

This M-type socket accepts an external antenna with an impedance of 50Ω.

■ SIDE PANEL



㉗ EXT SPK JACK

This jack accepts an external speaker or earphone with an impedance of 8Ω.

㉘ STRAPPING POST

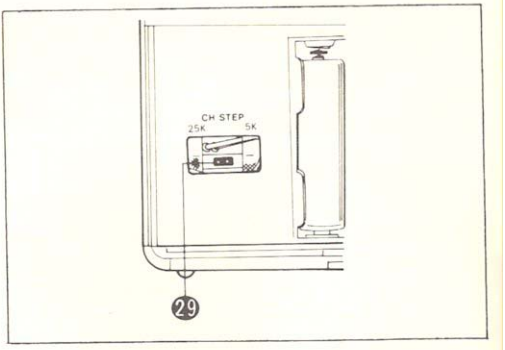
Attach the supplied shoulder belt to this post. See Fig. 6.

■ INTERNAL SWITCH

㉙ CH STEP SWITCH

This switch selects channel frequency scan stepping between 5 and 25 kHz. It is located behind the battery compartment cover.

NOTE:
The CH STEP switch is effective in the FM mode of operation only. In the SSB mode of operation, it is automatically set to 5 kHz's stepping.



■ MICROPHONE

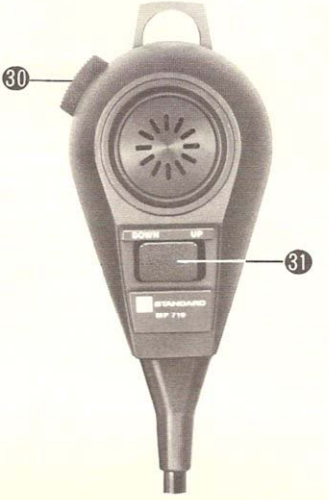
㉚ PTT BUTTON

To put the transceiver into the transmission mode, push the PTT button.

㉛ UP-DOWN CHANNEL CONTROL BUTTON

If the button is held down, channel frequency is stepped up or down continuously.

NOTE: The CH STEP switch is effective in the FM mode of operation only.
In the SSB mode of operation, it is automatically set to 5 kHz stepping.



4. BEFORE OPERATION

4.1 INSTALLING BATTERY PACKS

Install the specified battery packs in the unit's battery compartment of the unit as follows:

1. Loosen screw (22) on the rear of the unit with a coin and open the battery compartment cover (see Fig. 1).
2. The supplied battery holders are designed to hold 6 and 4 battery cells each. The smaller holder has a dummy cell in it.
3. Use nine manganese or alkaline battery cells (UM-3 1.5 V) with the dummy cell left installed in the smaller holder.
4. Use ten rechargeable Ni-Cad battery cells (1.2 V) with the dummy cell removed from the smaller battery holder.
5. After mounting batteries in the battery holders, install the holders in the battery compartment of the unit as illustrated below. Close the compartment lid and tighten screw (22) with a coin.

NOTE:
When using UM-3 battery cells (1.5 V), leave the dummy cell in the smaller battery holder.

HANDLING PRECAUTIONS FOR DRY CELLS

Careless handling of dry cells may result in electrolyte leakage or bursting. Note the following points.

1. When installing, be certain that their polarity is correct.
2. Do not mix new and used battery cells.
3. Some types of dry cells with similar shapes may have different voltages. Be sure to use the same type of battery cells.
4. Some types of dry cells are rechargeable while other types are not. Carefully read the notes on the cells before use.

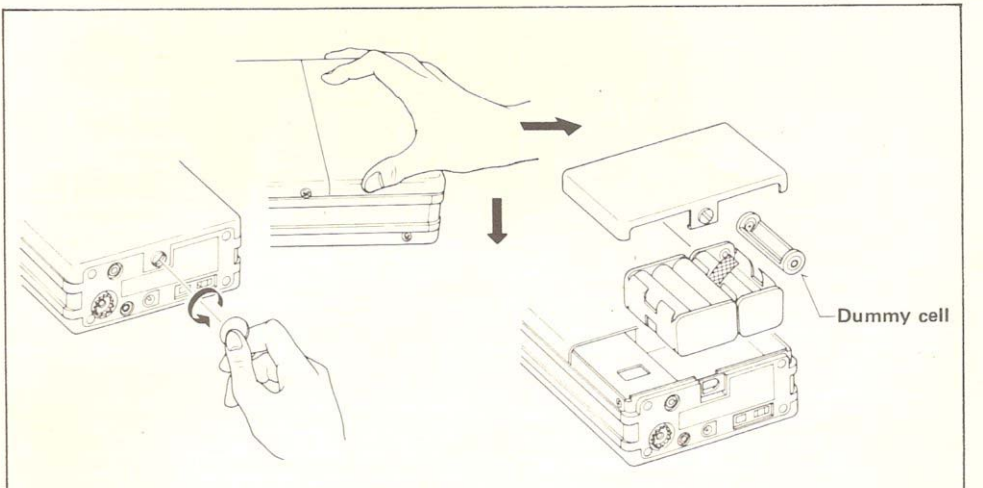


Fig. 1 Battery compartment lid removal

4.2 RECHARGING Ni-Cad BATTERY CELLS

1. Ni-Cad battery cells used in the unit require recharging before the meter pointer falls into the red zone.
2. When recharging the battery, be sure to turn the POWER/VOL control fully counter-clockwise to the OFF position.
3. Plug the optional charger into the charging socket (23) on C58 for charging (see Fig. 2). Optional charger: C12/230-6, 10 hours for 80% charging.

CAUTION:

1. **Do not try to recharge unrechargeable batteries such as UM-3 manganese or alkaline cells.**
2. **Avoid overcharging, as it shortens battery life.**
   For normal charing efficiency, the Ni-Cad cells should be charged under an environment temperature of more than 0° C.
3. **The battery charger is not usable as an external power source.**

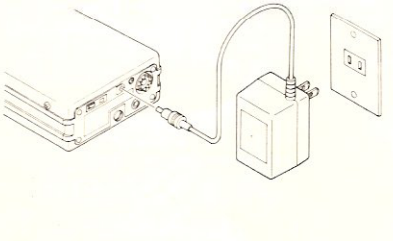


Fig. 2 Charging with the C12/230-6 charger

4.3 SUPPLY VOLTAGE CHECK

Check the supply voltage as follows:

1. Set the LIGHT/BAT CHECK switch (20) to the BAT CHECK position.
2. Turn the POWER/VOL control clockwise until the POWER switch clicks on. The lamps will glow and the meter will indicate the voltage supplied from the battery.
3. If the meter pointer is in the red zone on the meter scale (Fig. 3), the battery cells require replacement or recharging. When the battery cells installed in the unit are of UM-3 manganese or alkaline type, replace them. If they are rechargeable Ni-Cad cells, recharge them.
   When the transceiver is powered from an external power source, the meter will indicate the external source voltage.

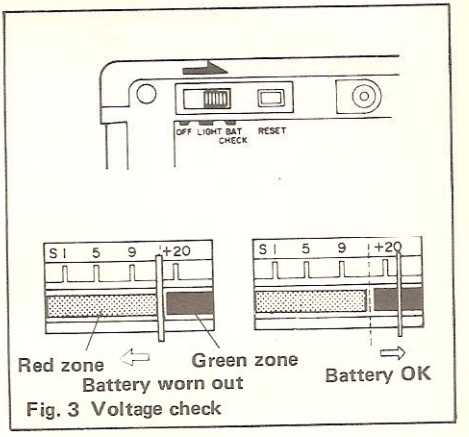


Fig. 3 Voltage check

4.4 BATTERY TYPES AND THEIR CHARACTERISTICS

Different types of batteries have different discharging characteristics (see Fig. 4).
The manganese and alkaline batteries have a relatively linear discharging characteristic, while the Ni-Cad battery has a sudden voltage drop after it maintaining a relatively constant output voltage level.

When used in the C58 transceiver, fully charged Ni-Cad batteries operate for approximately 2.5 hours for repetitions of one-minute transmission, one-minute reception, and 8-minute stand-by. The manganese battery cells allow an operating duration of approximately 2 hours in the same operation mode.

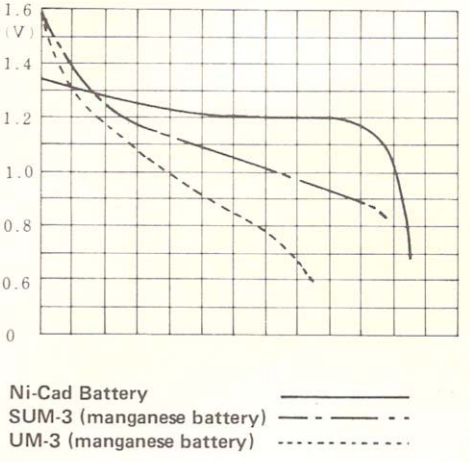


Fig. 4 Discharge characteristics

4.5 PORTABLE OPERATION

1. For portable operation, attach the supplied helical antenna to the BNC connector.
2. Attach the supplied shoulder belt to the strapping posts on the unit, and replace the microphone hanger in a convenient position on the shoulder belt. For mounting instructions, see Figs. 5 and 6.
3. We recommend the use of the optional carrying case CLC8, which will protect your equipment from possible damage and provide better maneuverability.

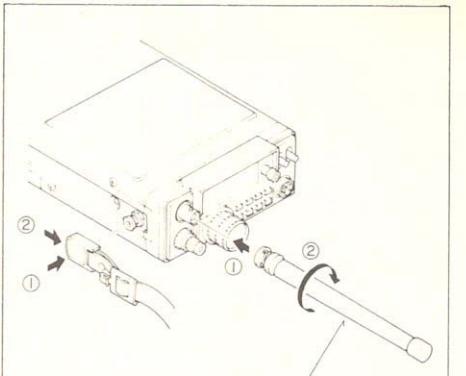


Fig. 5 Antenna connection Helical antenna

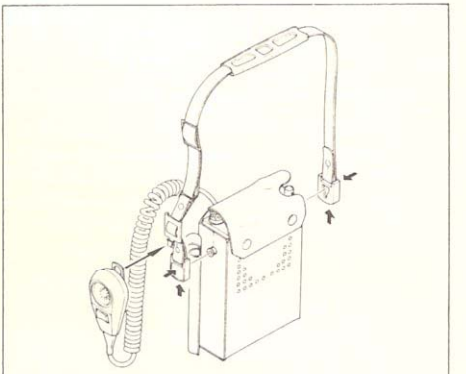


Fig. 6 Installing carring case CLC8

4.6 BACK-UP POWER FOR MICROPROCESSOR

The internal microprocessor is always backed up by the batteries even when the OFF/VOL control on the unit is set to the OFF position, so that stored channel frequency information remains intact.
Since the required back-up current is only approximately 40 μA, it consumes only very little battery power. However, if the unit is to be left unused for a prolonged period of time, it is adviseable that the batteries be removed from the unit.

4.7 EARPHONE

The EXT SPK jack on the unit accepts an external speaker (C207) with the rated impedance of 8 Ω or your earphone with a 3.5 mmϕ plug.

4.8 MOBILE OPERATION

For mobile operation, obtain the optional mobile bracket CMB8 from your dealer.

1. For power connection, refer to Fig. 7.

- When using only the C58 transceiver for mobile operation, use the supplied external power plug for power connection and install in it a fuse with a 1 A rating.
- For mobile operation, it is adviseable to use the optional line filter (CLF03) in the power supply line to prevent noise interference from the alternator wine.

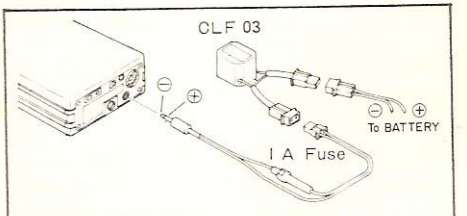


Fig. 7 Power Connection for mobile operation

2. Connect the mobile antenna coaxial cable to the C58 EXT ANT jack. Remove the supplied helical antenna.

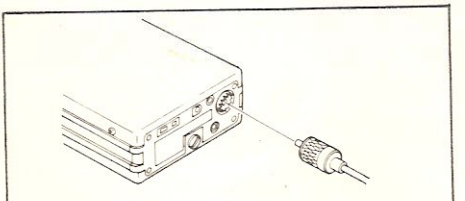


Fig. 8 Connecting external antenna

When using external speaker C207 (option), connect the cord to EXT SPK jack.

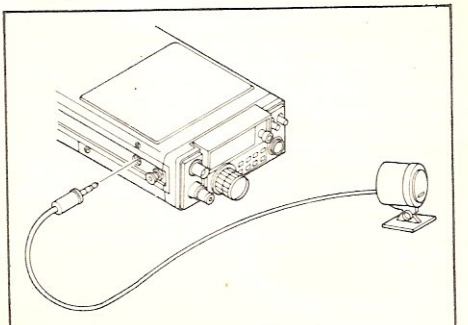
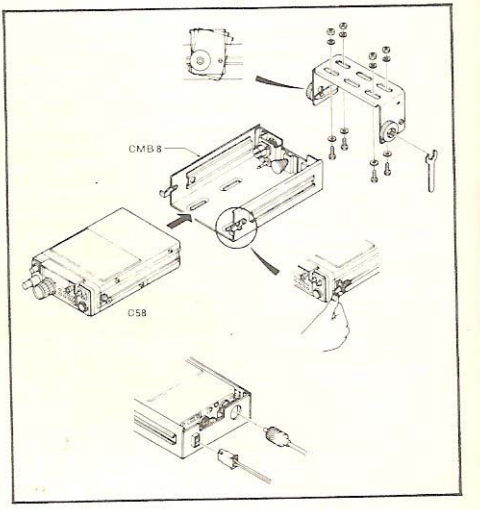
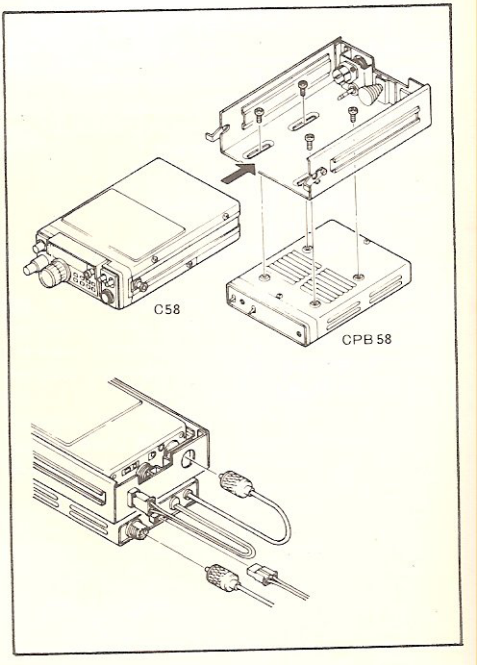


Fig. 9 Connecting external speaker

3. The use of mobile bracket CMB8 will allow you to pop in or out C58 with the pop-out gear on the bracket, resulting in improved use.



4. Combining the modile bracket (CMB8) with the optional linear power booster CPB58, your transceiver is powered to 25 W just by sliding the unit into the bracket. For optional equipment, refer to attached instructions.



4.9 BASE STATION OPERATION

1. When the unit is to be powered from a commercial AC power source via a regulated. DC power supply (13.8 V, more than 1 A), use the supplied external power plug for connection and install in it a fuse with a 1 A rating.
   For connection of power supply, refer to Fig. 11.
   When the transceiver unit is used with the power booster (CPB58), use a power supply of more than 6 A.
2. When using an external antenna for base station operation, disconnect the supplied helical antenna from its front socket.
   If the antenna you use has an extremely poor SWR, not only unsatisfactory transceiver performance but TVI may result. Adjust SWR always below 1.5.

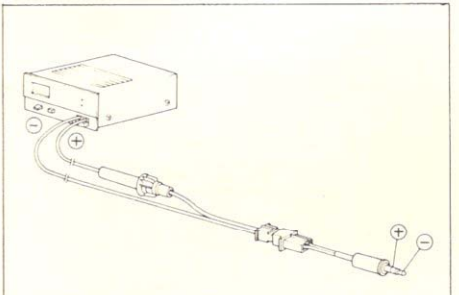


Fig. 10 Regulated DC power supply

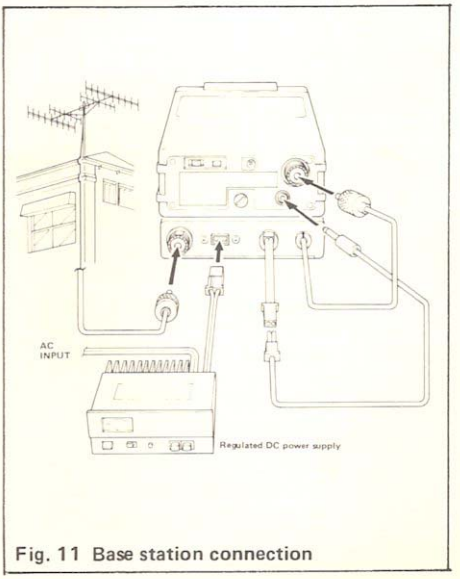


Fig. 11 Base station connection

4.10 MICROPROCESSOR MALFUNCTION

If the frequency readout or transceiver operation is not normal, or the operation keys don't work, depress the RESET button on the rear of the unit.
With resetting, the frequency readout will indicate "6.000" in the S mode, "6.600" in the R1 mode, or "6.000" in the R2 mode. The depression of the RESET button will erase the entire memory contents.

4.11 MICROPROCESSOR BACK-UP WHEN USING AN EXTERNAL POWER SUPPLY

When the transceiver is used for mobile or base-station operation, the internal microprocessor is not backed up unless the battery cells are installed.
To back up the microprocessor, install 4 alkaline batteries or 3 manganese batteries and one dummy cell into the larger battery cartridge. When rechargeable batteries are used, no dummy cell is required. The back-up current is only approximately 40 μA, which permits extended battery life.

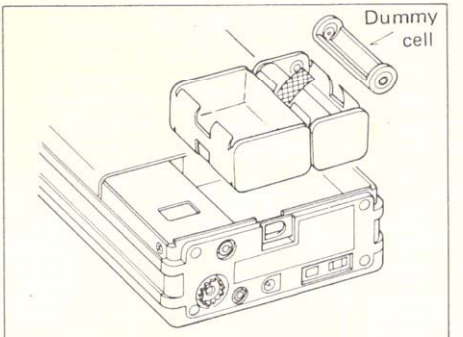


Fig. 12 Back-up battery installation

5. OPERATING INSTRUCTIONS

5.1 MODE SWITCH OPERATIONS

1. USB/CW (UPPER SIDE BAND)
SSB operations on the 2-meter band usually use the USB. CW mode operation is obtained by plugging a CW key into the KEY jack (26) on the rear of the unit. (For operations other than the CW mode, keep your CW key pulled out of the KEY jack (26).)

2. LSB (LOWER SIDE BAND)
The LSB mode operations are usually used for satellite communications.

3. FM
This position permits operations identical to those with conventional FM transceivers operating on the 2-meter band.

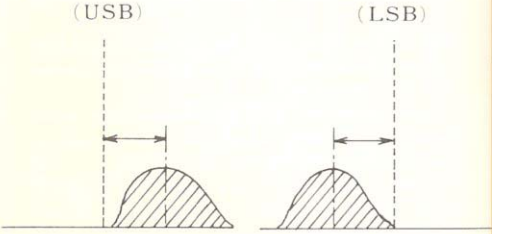
5.2 DIGITAL VFO

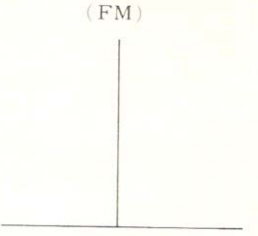
1. TUNING PROCEDURE
Tuning frequency is controlled with the Tuning control (4). Clockwise rotation of this control increases tuning frequency.
The frequency of digital VFOs is also controlable with the UP-DOWN switch on the microphone. When the UP or DOWN button is depressed and held, channel frequency steps up or down continuously at a predetermined stepping rate. The stepping frequency interval is selectable with the STEP key (8) from among 5 or 25 kHz, 1 kHz and 100 Hz in the frequency range of the 146.0000 MHz lower limit to the 147.9999 MHz upper limit.

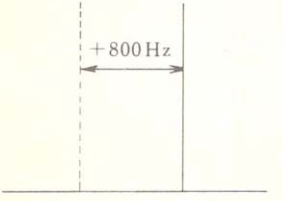
a. **SSB. CW mode**
Make a course tuning with 5 or 1 kHz stepping, then perform fine tuning with the 100 Hz stepping and the RIT control (19). To search for an occupied channel, use the 1 kHz stepping first, and when you hear a beat, use the 100 Hz stepping to approach and "zero-in" the target channel.
Before using the RIT control, tune in the desired frequency until the clearest audible output is obtained.

b. **FM MODE**
In the FM mode, tuning with the 5 or 25 kHz frequency stepping would be most convenient. Either 5 or 25 kHz stepping can be selected with the CH STEP switch (29) on the left to the battery compartment.

2. FREQUENCY DISPLAY
In the FM or SSB mode, the digital frequency display on the C58 indicates the carrier frequency, or the exact operation frequency.
In the CW mode, the readout displays the receive carrier frequency. The transmit frequency is 800 Hz higher than this receive carrier frequency.

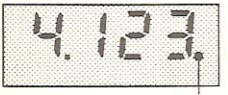






- **Tuning frequency stepping and frequency readout**
  The tuning frequency in the frequency readout steps up or down at the frequency interval selected with the STEP key. When one or more digits which are not displayed in the frequency readout are not zero, a dot goes on at the bottom right corner of the display.
  A 100 Hz's digit which is not displayed is represented with the lower right dot lit if other than "0". To clear the 100 Hz's indication, increase the frequency.

[Example 1] Display for 144.1234 MHz



(5/25 kHz STEP)

Dot goes on as 100 Hz's digit is 4.

(1kHz STEP)

Dot goes on as 100 Hz's digit is 4.

(100Hz STEP)

Only lower dot goes on to indicate even MHz's digit of 144 MHz and 146 MHz band.

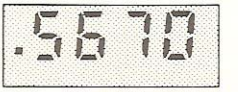
[Example 2] Display for 144.5670 MHz

(5/25 kHz STEP)

Dot goes on as 1 kHz's digit is 7.

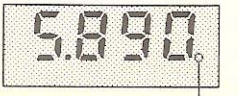
(1kHz STEP)

Dot remains off as 100 Hz's digit is 0.



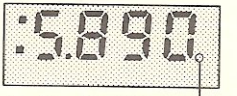
(100Hz STEP)

[Example 3] Display for 145.8900 MHz



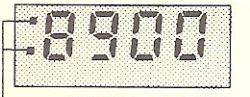
(5/25 kHz STEP)

Dot remains off as 100 Hz's digits are 0.



(1kHz STEP)

Dot remains off as the 100 Hz's digit is 0.



(100Hz STEP)

Both upper and lower dots go on to indicate odd MHz's digit of 145 MHz and 147 MHz band.

5.3 REPEATER OPERATION

The C58 can shift the transmission or reception frequency upward by 600 kHz for repeating operation. It also has a new tone burst feature for driving the repeater.

1. S, R1 and R2 operation frequency indications

[Example] For 146.00 MHz simplex operation frequency

- S mode

(RX)

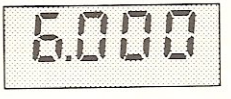
(TX)

- R1 mode

(RX)

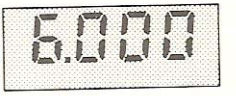
Reception frequency is shifted by +600 kHz.

(TX)



- R2 mode

(RX)



(TX)

Transmission frequency is shifted by +600 kHz.

2. CALL key feature

The CALL key is used to manually transmit the repeater driving tone burst of 1750 Hz. While the key is depressed, the tone burst is on the air.

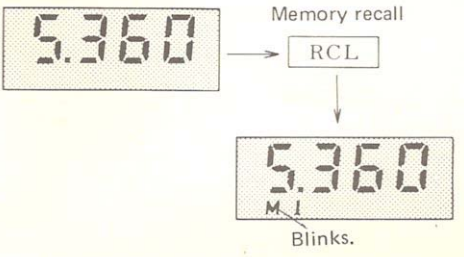
3. PTT button-operated tone burst.

The repeater driving tone burst, also, can be transmitted with use of the PTT button in place of the CALL key manual depression. Depress the PTT button two times continually. The tone burst will be on the air for around one second.

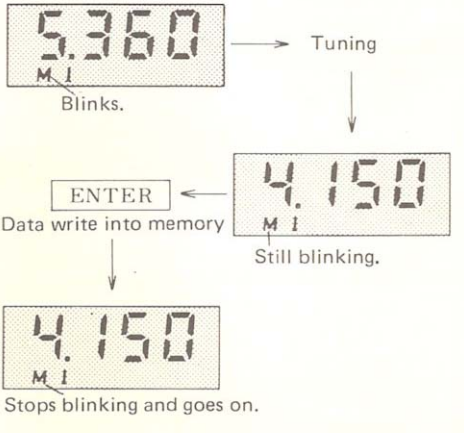
5.3 MEMORY OPERATIONS

The C58 contains 5 independent memories, each storing a channel frequency, operation mode, and channel stepping interval. The memory operation feature is very convenient to access frequencies of frequent use (club channels, etc.).

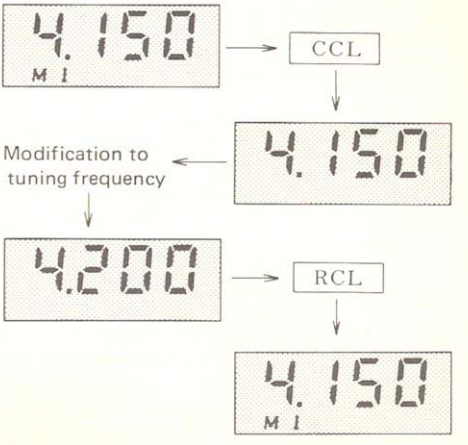
1. To write data into memory:
Depress the RCL key (7). When no data is stored in memory M1, the frequency displayed just before the RCL key depression will be displayed and mark "M" will start blinking.



The blinking "M" indicates that no data is stored in M1. Tune in the desired frequency with the Tuning control (4), MHz key (6), STEP key (8), or UP-DOWN switch (31). Depress key ENTER (5) to store the tuned frequency; mark "M" will stop blinking. You have now stored the desired channel frequency data into memory M1.



Depress key CCL (12) to drop the memory recall mode; mark "M1" will go off. To recall the stored frequency again, depress RCL key.

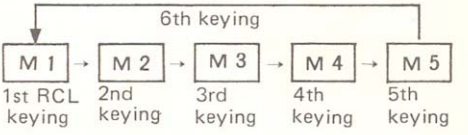


Other channel frequency data can be stored in memories M2–M5 with the same procedure as described just above.

2. MEMORY RECALL (1)

[for the same mode]

Pressing the RCL key initially recalls a frequency datum stored in memory M1. Pressing it a second time recalls a frequency datum stored in M2.
Each time the RCL key is depressed, frequency data are recalled sequentially from memory addresses M1 through M5.

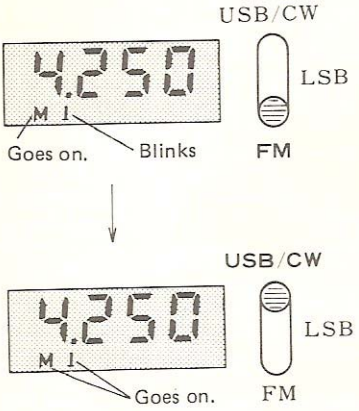


The 6th keying returns memory access to M1. When the memory contents are recalled on the display by RCL operation, press the CCL key to clear the RCL function and bring back the data displayed before the RCL key was depressed.

MEMORY RECALL (2)
[for different modes]

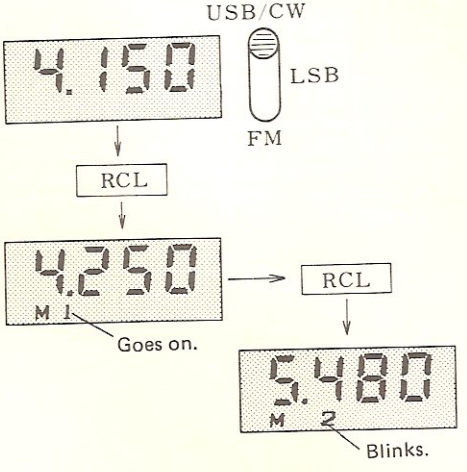
[Example]
When frequency datum 144.250 MHz is stored in M1 in the SSB mode, and datum 145.48 MHz is stored in M2 in the FM mode:

- When datum 144.250 MHz is recalled in the FM mode:



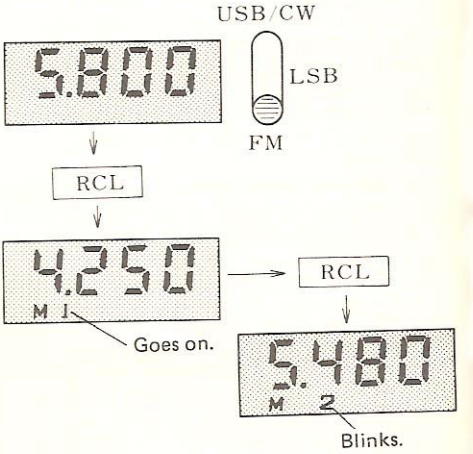
When a frequency datum is recalled in the mode in which it is stored, mark M and address number go on. When the frequency datum is recalled in a mode other than that in which it is stored, the address number blinks. This is convenient to discriminate the modes in which frequency data are stored in memory.

- When datum 145.48 MHz (M2) is recalled in the SSB (USB/CW or LSB) mode:



When M2 is recalled, memory address "2" blinks to indicate that the datum was stored in M2 in the FM mode.

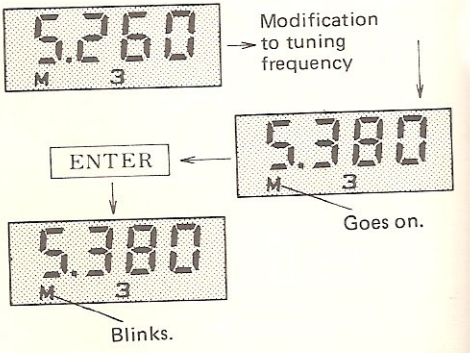
- When recalled in the FM mode:



When M1 is recalled in the FM mode, memory address "1" blinks to indicate that the datum was stored in the SSB mode.
The memory mode in which frequency datum is stored can be identified by blinking memory addresses (1 – 5).

3. MEMORY REWRITING

To rewrite a frequency datum stored in a memory, first tune in the desired frequency into which memory content is to be modified, then depress the ENTER key.



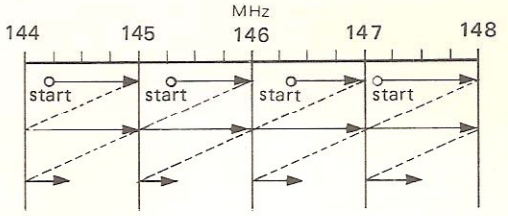
When the tuning frequency is changed, "M" starts blinking to indicate that memory rewriting is ready. When you wish to suspend frequency alteration, depress the CCL key instead of the ENTER key. This will leave the memory content unchanged.

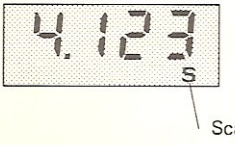
5.5 FREQUENCY SCANNING

There are two channel frequency scanning systems depending on operation modes. The FM mode uses the BUSY SCAN system in which scan stops at a channel where an input signal is present, and starts again when the input signal ceases. The SSB mode uses the FREE SCAN system in which channel frequencies are scanned regardless of the presence/absence of input signals.

a. All scan

- Depress the SCAN ALL key (9) to start scanning the entire channel frequencies in the mega-hertz band now selected. The scan step interval is selectable with the STEP key (8) from 5/25 kHz, 1 kHz, and 100 Hz.
- During scanning, mark "S" is displayed at the bottom right corner of the display. When scanning is stopped at a busy channel in the FM mode, depressing the SCAN ALL key again will restart scanning.





Scan busy indicator

- To stop scanning, depress the CCL key (12) or the PTT button (30). The frequency readout will stop at the frequency displayed just before the CCL key or PTT button is depressed, and scan busy indicator "S" will go off.

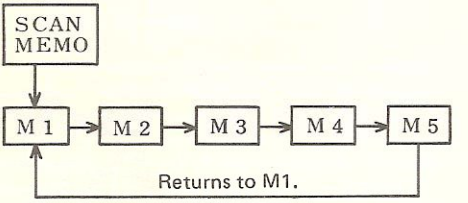
b. Memory scan

When the SCAN MEMO key (11) is depressed, channel frequencies stored in memory addresses M1—M5 are scanned sequentially. During scanning, mark "S" and the pertinent memory addresses M1—M5 are displayed in the frequency readout.

Since the C58's memory also holds operation mode information as well as frequency data, only the channel frequencies stored in a certain operation mode are scanned in that mode. In other words, channel frequencies stored in the FM mode are scanned in the FM mode; and those stored in the SSB mode are scanned in the SSB mode.

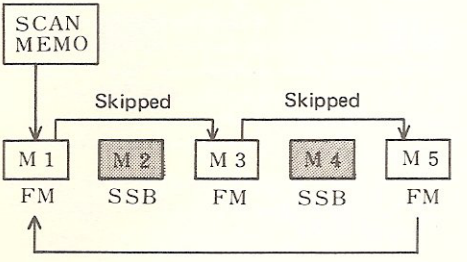
When no frequency datum is stored in any memory addresses, they are skipped in any operation mode.

[Example 1]
When frequency data are stored in memories M1 through M5 in the same mode:

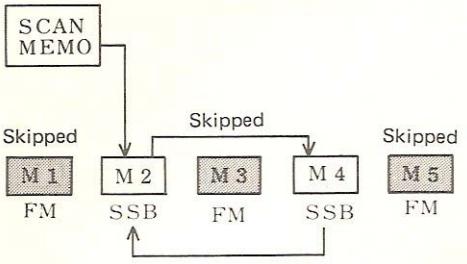


[Example 2]
When the FM mode uses memories M1, M3, and M5, and the SSB mode uses memories M2 and M4:

- M2 and M4 are skipped in the FM mode.

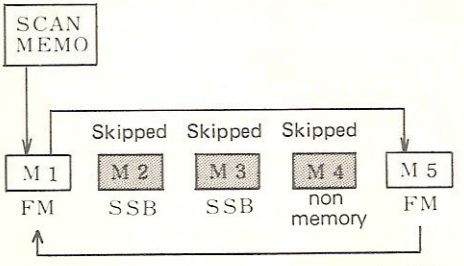


- M1, M3, and M5 are skipped in the SSB mode.

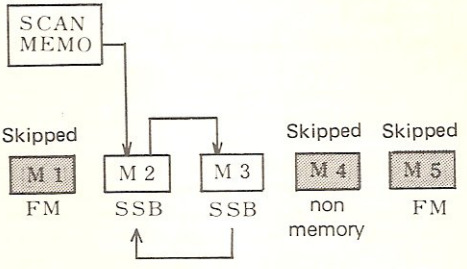


[Example 3]
When the FM mode uses memories M1 and M2, and the SSB mode uses memories M2 and M3, and no datum is stored in M4:

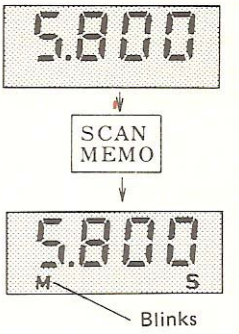
- M2, M3, and M4 are skipped in the FM mode.



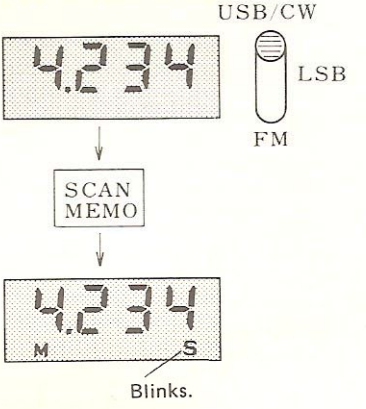
- M1, M4, and M5 are skipped in the SSB mode.



[Example 4]
No datum is stored in M1–M5, mark "M" at the bottom left corner of the frequency display blinks.



[Example 5]
When all stored data are those written in an irrelevant mode, mark "S" blinks at the bottom right corner of the display:
Data are written in M1–M5 in the FM mode.



c. **Scan rate**
In the SCAN MEMO mode, each channel is scanned at approximately 1 second rate.
In the FM mode, scanning is automatically restarted 1.5 second after the input signal ceases at the pertinent channel. This delay time prevents erroneous channel step-out due to momentary signal intermission or other causes.

	5k/25k	1k	100Hz
Channels/ sec	4 CH	8 CH	16 CH
Time/ channel	250 msec	125 msec	62.5 msec

5.6 RIT (RECEIVER INCREMENTAL TUNING) OPERATIONS

The RIT feature changes receiver's tuning frequency while keeping transmission frequency constant. The variable frequency range is approximately ±1 kHz.
The frequency obtained at the 0 (center) position of the RIT control is almost identical to that obtained at the OFF position of the control. Turning the RIT control clockwise beyond the 0 position increases receiver's tuning frequency over the transmission frequency, and turning it counterclockwise below the 0 position decreases tuning frequency below the transmission frequency. In this case, however, the frequency readout in the display remains unchanged. The RIT control is useful when the frequency of the mate station gradually deviates from its original channel frequency during communication. In such a case, turn the RIT on and follow up the mate station until the best tuning is recovered. When communication is over, be sure to set the RIT control to OFF.

5.7 NOISE BLANKER (NB)

The noise blanker is intended to suppress impulsive noise interference from automobiles, etc. It is especially useful for mobile operations. The NB is not effective in the FM mode. When the operation mode is switched from the SSB into FM, the NB is automatically switched off, and it remains off even if operation mode is switched back to SSB. In such a case, the PUSH NB switch must be depressed again to activate the internal NB circuit.

5.8 METER

a. **S (Input signal strength)**
Indicates received signal strength. Signal strength of approximately 20 dBμ corresponds to "S9" on the meter scale.

b. **RF (Transmission power)**
Indicates transmitter's emission power. The rated power into 50-ohm load corresponds to +20 on the meter scale. (If your antenna has a poor SWR, the meter reading may deviate from this value.)

c. **Supply voltage (BAT CHECK)**
Indicates the supply voltage when the rear switch (20) is at the BAT CHECK position. The red zone on the meter scale indicates supply voltage below 9.6 V.

5.9 CW OPERATIONS

For CW operation, set the MODE switch (17) to USB/CW, and plug your key into the rear KEY jack (26) on your unit as shown in Figure 14. For transmission, make keying while depressing the PTT switch. As you make keying, the internal side-tone circuit is activated to provide keying tone of approximately 800 Hz from the speaker. (The C58 does not use the semi-break-in system, and always requires PTT switch operation for CW transmission.)

During reception, zero-in is accomplished by setting the keying tone from the mate station to approximately 800 Hz (side tone). The KEY jack accepts a standard 3.5 mm dual-conductor plug.

Using the internal side-tone circuit, you can practice CW keying. To do this, connect your key as shown in Figure 14 and set the MODE switch to FM. Tune in a vacant channel and turn the squelch control (3) fully clockwise. As you are keying, keying side tone will be heard through the speaker. (If, in this case, the PTT switch is depressed, unwanted CW emission will result. Be sure to leave your rig in the reception mode.)

NOTE:
To make transmission in any mode other than the CW, keep your key pulled out of the KEY jack.

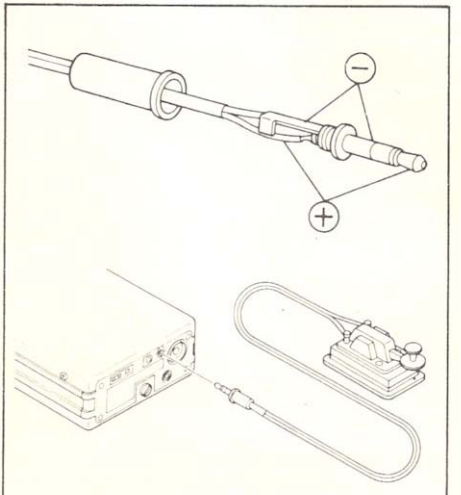
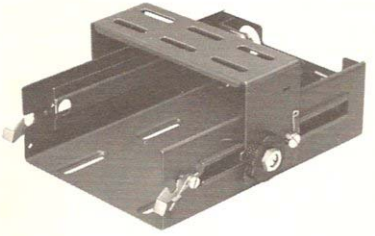


Fig. 14 Key connection

6. OPTIONAL ACCESSORIES

To use the C58 effectively, employ the following optional accessories.



- Mobil bracket CMB8

- Linear power amp. CPB58

- Carrying case CLC-8

- External speaker C207M

SERVICE MANUAL SECTION

THEORY OF OPERATION

RECEIVER SECTION

1. FM RECEIVER

- The FM receiver section of the C58 uses the double superheterodyne system plus quadrature FM detector. The 1st and 2nd intermediate frequencies are 10.7 MHz and 455 kHz respectively.
- The signal coupled to the antenna terminal J806 (BNC) or J804 (M type) goes to RF amplifier QR01 (2SK241) via an antenna switch. After amplified by QR01, the signal couples to the 1st mixer, where it is mixed with the local frequency from the PLL, down into the 1st IF signal of 10.7 MHz. The 1st IF signal goes through crystal filter FR01 and 1st IF amplifier QR03 (2SK241), before coupled to integrated circuit QR08 (MC3357).
- QR08 contains a 2nd mixer, IF amplifier, quadrature detector, noise amplifier for squelch, squelch switching amplifier, and 2nd local oscillator.
- The signal coupled to pin 16 of QR08 is internally mixed with the 2nd local frequency (10.245 MHz) to be converted into the 2nd IF signal of 455 kHz.
  The 2nd IF signal goes through ceramic filters FR03 and FR04, is amplified by an internal limiting amplifier, and then demodulated by the quadrature detector. The detector output is output to pin 9 of the same IC.
- The detector output is amplified by AM amplifier QR09 (FM only), goes through a volume control, and is finally amplified by AF power amplifier QR11 (μPC-575C2) to drive the built-in speaker, E801.
- The squelch circuit uses QR08's internal active high-pass filter (with noise amplifier) to extract noise component (approx. 5 kHz) from the detector output. The noise component is rectified by diodes QR34 and QR35 into a corresponding DC voltage, which is coupled to pin 12 of QR08. The squelch control is connected across pin 12 of QR08 and the ground to control the squelch level. When the squelch is activated (no noise heard from the speaker), pin 14 of QR08 has a high impedance; when the squelch is inactive, pin 14 is internally grounded. When the squelch is active, therefore, pin 14 of QR08 is pulled up to approximately 3.6 V via RR73 (10 kΩ). This potential makes pin 8 of QR11 high via QR40, turning QR11 off. When the squelch is inactive (noise heard from the speaker), pin 14 of QR08 is at the ground level, causing pin 8 of QR11 to be set low. This turns QR11 on to cause audible noise heard through the speaker.

2. SSB RECEIVER SECTION

- C58's SSB receiver section uses the single superheterodyne system with intermediate frequency of 10.7 MHz.
- The signal coupled to the antenna terminal is amplified in much the same way as in the FM mode and appears at the output of IF amplifier QR03. The output of QR03 couples to another IF amplifier QR04, QR05 and QR06 (MOS FET).
  The output of the IF amplifier goes to SSB detector 2R32. The demodulated AF signal is then amplified by AF amplifier QR07 provided exclusively for SSB.
  The AF amplifier output couples to AF power amplifier QR11 via a volume control and drives the built-in speaker.
- The AGC network controls RF and IF amplifier gain according to input signal strength, by controlling the potential at the 1st gate of each FET over a range from 0 to -1 volt. The AGC picks up IF signal from the collector of IF amplifier QR06 via CR73 (15pF). This is rectified by diodes QR37, QR38, QR39 and QR44 into a negative voltage, which is coupled to the 1st gates of RF amplifier QR01 and IF amplifiers QR03, QR04 and QR05 to control each amplifier gain. The attack and release time of the AGC network is determined by QR01, CR71, RR74 and CR75.

3. NOISE BLANKER (N.B.)

When the N.B. switch is set to ON in the SSB mode, a voltage of approximately +5 VDC is applied at pin 1 of JT01. This voltage causes to close the N.B. switch (QR07 and QR08), which supplies necessary power to the N.B. circuit.
The noise component picked up from the collector of IF amplifier QR03 is amplified by N.B. amplifiers QN02 and QN03. The output of the N.B. amplifier is rectified by QN30 and QN31 to drive N.B. switch QN05. When N.B. switch QN05 is closed (when pulse noise input is preset), a reverse bias is applied to a N.B. gate QR30 to block the pulse noise input.
For signals with relatively high mean level, such as adjacent station signals or tuning signals, the AGC (QN06) provided within the N.B. network is activated to retain the N.B. gate on by controlling the noise amplifier gain.

4. S METER

The S meter circuit is shared by the FM and SSB modes, and utilizes their AGC characteristics. The positive terminal of the meter is connected to pin 2 of JR02, which couples to the +5 V voltage regulator output, QR05 (2nd gate) via RR58, RR57 and RR56. The negative terminal of the meter is connected to pin 1 of JR02, which couples to the source of QR05 via QR33. As the 1st gate of QR05 varies into a negative potential according to input signal strength, QR05's source current is decreased, which causes the source voltage to drop below that in the no signal state. As a result, a current flows from the positive terminal of the meter through the source resistor (RR38) of QR05, causing the meter to deflect accordingly.

TRANSMITTER SECTION

1. FM TRANSMITTER

- The signal from an external microphone (MP716) goes through microphone amplifier Q201b, limiter amplifier Q202a, and roll-off filter Q202b, and couples to varicap diode Q111 in the VCO to provide direct frequency modulation on the VCO output.
- The PLL output is coupled to the gate of balanced mixer QT08 and QT09, where it is mixed with FM subcarrier to provide a carrier-frequency signal. The carrier-frequency signal goes, via pin 1 of JT06, through the linear amplifier stage, APC amplifier QB01, TX amplifier QB02, TX driver QB03 and TX final amplifier QB05 and finally couples to the antenna via an antenna switch.
- The APC network picks up the carrier signal from the output of the linear amplifier. The carrier is rectified by QB07 and QB08 and coupled to QB09 (APC-DC amplifier), which controls the 2nd gate potential of the APC amplifier to keep the RF output power always constant.

2. SSB TRANSMITTER

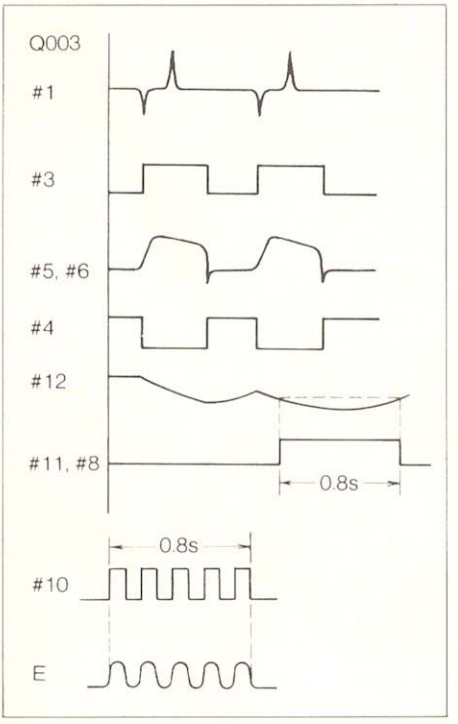
- The signal from the external microphone is amplified by microphone amplifier Q2016 and SSB microphone amplifiers QT06 and QT07 before coupled to balanced modulator QT34, where the subcarrier is subject to amplitude modulation with the microphone signal to create side bands. The carrier is suppressed with RT18 and CT24. The side bands are amplified by younger amplifier QT05, then coupled to an SSB bandpass filter. The upper or lower side band output from the band-pass filter is amplified by another younger amplifier QR04. The output of QR04 couples to a balanced mixer, of which output is amplified by linear amplifiers in much the same way as FM signals and finally coupled to the antenna via the antenna switch.

- CW operation
  In the CW mode, reception frequency agrees with the USB frequency, while transmission frequency is 800 Hz higher than reception frequency.
  When a CW key is plugged into the KEY jack and the PTT button is depressed, the output of a subcarrier oscillator goes through a balanced modulator (QT34), younger amplifier (QT05), SSB BPF and another younger amplifier (QR04) and couples to balanced mixer comprised of QT08 and QT09, where it is mixed with the local frequency signal from the PLL to create a carrier frequency signal. When the key is closed while the PTT button is held down, the source and emitter of linear amplifiers QB01 and QB02 are grounded via resistors. As a result, the carrier signal is amplified and coupled to the antenna.

Tone Burst Generator

When the PTT switch is used:

When the PTT switch is pressed initially, the potential at terminal A in the schematic diagram lowers. This causes #1 of Q003 to lower momentarily, causing #3 of Q003 to rise. As a result, #5 and #6 of Q003 also rise, which lowers #4 of Q003. The potential at #12 and #13 of Q003 starts dropping but does not reach its lowest level, leaving the tone burst circuit inactive.
When the PTT switch is pressed twice consecutively, the potential at #12 and #13 of Q003 goes to its lowest level. This causes #11 of Q003 to rise, activating the tone burst generator. The potential at #12 and #13 of Q003 gradually increases, and #11 of Q003 is maintained at a high level for 0.8 seconds. This means that the tone burst signal is transmitted for only 0.8 seconds when the PTT switch is pressed a second time.
The output of the tone burst generator is level-adjusted by R010, then applied to the PLL modulator via R011 and C006.

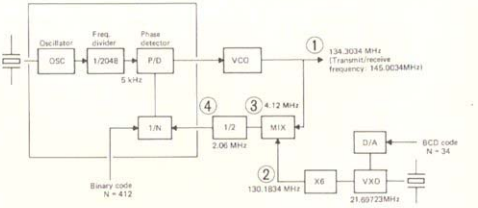


When the CALL button on the C58 is used:

- Pushing the CALL button applies a voltage, +9V, to terminal B in the schematic diagram. This brings up the potential at the base of Q001, turning it on and therefore causing terminal A to lower, putting transceiver in the TX mode.
- As a high level is applied to #5 and #6 of Q003 through Q002, #4 of Q003 is maintained at a low level while the CALL button is held down.
  Number 12 and #13 of Q003 are lowered, raising #11 and #8, which activates the tone-burst generator.
- When the CALL button is released, Q001 is turned off. This causes terminal A to rise, putting the transceiver in the RX mode.
- Q006, a voltage regulator, holds the voltage at Q003 at +9V.

PLL SECTION

- The PLL block in the C58 is controlled by 8 bit binary codes (9 bit PLL codes with its MSB fixed at high level) and 2 BCD digits for D/A conversion, both furnished with the internal microprocessor.
  The output frequency of the PLL is 10.7 MHz lower than the frequency readout.



[Example] 145.0034 MHz in FN Mode

NOTE:

1. **F in frequency (3) remains unchanged over a range from 145.0000 ~ 145.0099 MHz (frequency (4) also remains unchanged.).**
2. **PLL local frequency (2) changes over a range from 130.1800 ~ 130.1899 MHz.**
3. **Output frequency (1) changes over a range from 134.3000 ~ 134.3099 MHz.**
4. **Binary code and F in frequencies (3) and (4) change at 5 kHz interval.**
5. **In each 5 kHz span wherein binary code remains unchanged, PLL local oscillation (2) changes to activate 1 kHz and 100 Hz steps.**

TX • RX	①	②		③	④	
145.0000	134.3000	130.1800	Changes	4.1200	2.0600	Remains unchanged.
145.0001	134.3001	130.1801		4.1200	2.0600	
⌇	⌇	⌇		⌇	⌇	
145.0099	134.3099	130.1899		4.1200	2.0600	
145.0100	134.3100	130.1800		4.1300	2.0650	

1. PLL INTEGRATED CIRCUIT (Q106)

The PLL integrated circuit contains the following functional blocks on a single chip:

- Master oscillator: 10.24 MHz
- Phase detector (P/D)
- Programmable counter (1/N)
- Unlock detector

(1) Programmable counter (1/N)
The 8-bit binary code and one high-level bit (9 bits in all) furnished from the microprocessor determine the dividing ratio, N, for the programmable counter. The signal frequency from a pre-scaler is divided according to by the programmed dividing ratio and coupled to the phase detector (P/D).

(2) Phase detector (P/D)
The P/D detects the phase difference between the 5 kHz reference frequency (10.24 MHz master osicllation divided by 2048) and the programmable counter output. The detected differential phase signal is obtained at pin 7 of the IC, and is converted into a DC voltage by a C/R integration network. The DC voltage is coupled to varicap diode Q110, which controls VCO output frequency.

BAND	FREQ. READ	FREQ. DIV.	BINARY CODE									D/A IND.	A/B CODE	
			R_8	R_7	R_6	R_5	R_4	R_3	R_2	R_1	R_0		A	B
	144.000	312	1	0	0	1	1	1	0	0	0	00	1	0
	144.005	312	1	0	0	1	1	1	0	0	0	50	1	0
	144.010	313	1	0	0	1	1	1	0	0	1	00	1	0
	⋮													
	144.995	411	1	1	0	0	1	1	0	1	1	50	1	0
A	145.000	412	1	1	0	0	1	1	1	0	0	00	1	0
	145.005	412	1	1	0	0	1	1	1	0	0	50	1	0
	⋮													
	145.985	510	1	1	1	1	1	1	1	1	0	50	1	0
	145.990	511	1	1	1	1	1	1	1	1	1	00	1	0
	145.995	511	1	1	1	1	1	1	1	1	1	50	1	0
	146.000	312	1	0	0	1	1	1	0	0	0	00	0	1
	146.005	312	1	0	0	1	1	1	0	0	0	50	0	1
	146.010	313	1	0	0	1	1	1	0	0	1	00	0	1
	⋮													
	146.995	411	1	1	0	0	1	1	0	1	1	50	0	1
B	147.000	412	1	1	0	0	1	1	1	0	0	00	0	1
	147.005	412	1	1	0	0	1	1	1	0	0	50	0	1
	⋮													
	147.985	510	1	1	1	1	1	1	1	1	0	50	0	1
	147.990	511	1	1	1	1	1	1	1	1	1	00	0	1
	147.995	511	1	1	1	1	1	1	1	1	1	50	0	1
A	144.000	312	1	0	0	1	1	1	0	0	0	00	1	0

2. VCO

The VCO in the C58 consists of an oscillator (Q112) and a buffer amplifier (Q113).
The VCO output frequency is controlled by the varicap diode (110) to which the control voltage is furnished from the PLL IC. The maximum frequency variation span is 6 MHz.

3. LOCAL OSC

The minimum frequency step is 10 kHz as seen in the PLL code Table above. As the C58 changes it in steps of 1 kHz and 100 Hz, however, the local OSC (VXO circuit) in the PLL varies between 0.0 and 9.9 kHz. The VXO circuit, also, shifts the frequency by ±1.5 kHz in each of the USB, LSB and FM modes of operation.

(1) VXO circuit
The C58 has two VXOs: one is for the band A ranging from 144.0000 to 145.9999 Mhz and the other for the band B from 145.0000 to 147.9999 MHz. The VXO for the band A is an oscillator, consisting of a crystal X102 (21.6975 MHz) and Q303, the frequency of which is changed by two varicaps Q301 and Q302 and L301. The varicap Q301, which is for shifting the frequency depending on the mode of operation, has a bias around 4V applied. Q302 has an applied voltage changing depending on the 1 kH's or 100 Hz's digit of an operation frequency displayed as controlled by the signal output of the D/A converter.
The VXO for the band B consists of a crystal X103 (22.0308 MHz), Q305, Q306 and Q307. Switching from the band A to B and vice versa is made in a way that the microprocessor controls a switching circuit, consisting of Q308, Q309, Q310 and Q311.

(2) 6-fold frequency multiplier (Q304)
The signal output of the VXO circuit is frequency-multiplied by 6 through Q304, L302 and L303. The frequency-multiplied signal is injected into a mixer, consisting of Q103.

4. DIGITAL TO ANALOG CONVERTER (Q401)

The D/A converter converts the 1 kHz/100 Hz BCD data (2 digits) from the microprocessor into the corresponding analog voltages. It consists of bit weighting resistors R451 ~ R457, R461 ~ R467 and R471, output span control

resistors R480 and R481 and output buffer Q401. The minimum and maximum output voltages are obtained when the BCD input code is 00 and 99 respectively. The D/A converter output is coupled to Q302 and Q306 in the VXO circuit to control the 1 kHz and 100 Hz orders of the PLL output.

D/A INPUT CODES

	1	2	4	8	10	20	40	80
Display	D_0	D_1	D_2	D_3	D_4	D_5	D_6	D_7
00	0	0	0	0	0	0	0	0
01	1	0	0	0	0	0	0	0
02	0	1	0	0	0	0	0	0
09	1	0	0	1	0	0	0	0
10	0	0	0	0	1	0	0	0
11	1	0	0	0	1	0	0	0
19	1	0	0	1	1	0	0	0
20	0	0	0	0	0	1	0	0
21	1	0	0	0	0	1	0	0
97	1	1	1	0	1	0	0	1
98	0	0	0	1	1	0	0	1
99	1	0	0	1	1	0	0	1
00	0	0	0	0	0	0	0	0
Frequency display								

The output to the D/A converter has two digit BCD coding each having 4 bits.

5. SHIFT CIRCUIT

The shift circuit shifts PLL output frequency by +1.5 kHz for the USB mode and −1.5 kHz for the LSB mode with respect to the frequency in the FM mode. It also provides frequency variation controlled by the RIT control (approx. ±1 kHz).

Shift voltages provided by R402, R404 and R406 for each mode are coupled to Q301 and Q305 via buffer Q201-a. When Q409 is turned on (TX mode with RIT off), the RIT control is made inactive; when Q411 is turned on, the RIT control is made active. The RIT control varies receiver's tuning frequency only, while keeping the frequency readout constant.

6. MIXER (Q103)

The signal output of the VCO is passed through a buffer amplifier, consisting of Q113 and Q120, to the mixer (Q103). This mixes the VCO signal for the band A of 133.3000 to 135.2999 MHz and the band B of 135.300 to 137.2999 MHz with the local oscillator signal for the band A of 130.1800 to 130.1899 MHz and the Band B of 130.1800 to 130.1899 MHz, respectively, to produce a signal of 3.12 to 5.11 MHz.

7. PRESCALER

The prescaler is essentially a frequency divider using J-K flip-flops, which outputs a half the frequency of the input signal.

8. OUTPUT AMPLIFIER AND UNLOCK SWITCH CIRCUIT

The VCO output is amplified by Q113, Q120 and Q121, and is coupled to output switch Q122 and Q123, where it is subject to transmit/receive mode switching before coupled to the transmitter or receiver section.

If the PLL circuit is unlocked, the DC output voltage (unlock output integrated by a C/R integrator) drops. This causes the unlock transistor switch, Q124, to turn off. As a result, output amplifier Q120 and Q121 are made inactive to block the PLL output. This results in prevention of unnecessary emission upon PLL unlocking.

CONTROL SECTION

- Microprocessor (QL01)
- Expander (QL02)
- Keyboard
- Rotary switch
- Control switches

1. The control section provides the following control outputs:

(1) PLL programmable counter control code output:
An 8-bit binary code to determine the dividing ratio (N) of the PLL programmable counter is output at pins 15 ~ 22 of QL02.

(2) D/A converter input code:
Two digit 4 bit code (8 bits in all) of D/A converter data is output at pins 15 ~ 22 of QL02.

(3) LCD drive output:
LCD driver Q801 accepts driving input from pins 01, 02, 03, 07 and R11 of QL01.

(4) Buzzer drive output:
Buzzer driven QL03 is driven by the output at R8 of QL01.

(5) NB drive output:
The noise blanker is activated by HIGH output of this NB drive signal.

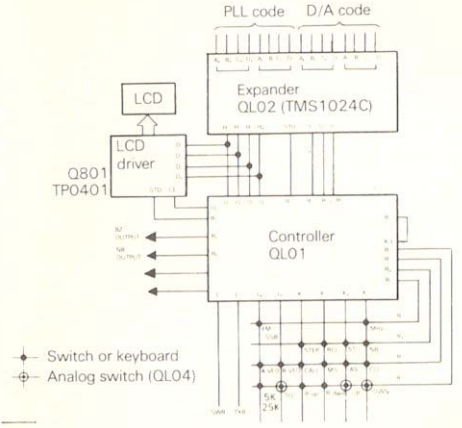
(6) Band A/B switching
In switching for the band A, the level at pin 9 on QL01 is high and the one at pin 10 is low; for the band B, the level at pin 9 is low and the one at pin 10 is low.

2. QL01 requires the following inputs:

(1) Initial clear
A positive pulse applied at pin 35 (INT) of QL01 clears the entire internal circuit of QL01.

(2) Matrix circuit (R2, R3, R4, R5, L4, L8, K1, K2, K4 and K8)

MICROPROCESSOR-ASSOCIATED CIRCUIT



- **Channel selection**

(1) CHANNEL selector
The CHANNEL selector uses pulse switches, which close matrix R2-K1 for upward channel scanning, and matrix R2-K2 for downward channel scanning.

(2) Channel UP/DOWN scanning with the MIC switch:
The channel control on the microphone uses analog switches to close matrixes R2-K4 for upward scanning, and R-K8 for downward scanning. A DC potential is applied to pins 5 (for UP) and 13 (for DOWN) of QL04 to control the analog switch.

- **Keyboard functions**

(1) MHz
The MHz switch is activated by closing matrix R5-K8. It alternately selects the 144, 145, 146 and 147 MHz bands.

(2) CH STEP
The CH STEP selector is activated by closing matrix R4-K1. This selector selects channel stepping interval from 5/25 kHz, 1 kHz and 100 Hz.

(3) Cancel (CCL)
The CCL switch is effected by closing matrix R3-K8. It cancels the MEMO RCL, SCAN ALL, SCAN MEMO and CALL CH features.

(4) SCAN MEMO
The SCAN MEMO feature is effected by closing matrix R3-K2. This feature scans frequencies stored in internal memories.

(5) SCAN ALL
The SCAN ALL feature is activated by closing matrix R3-K4. This feature scans up a 1 MHz frequency span at the displayed frequency stepping interval.

(6) MEMO RCL
The MEMO RCL feature is effected by closing matrix R4-K2. This feature recalls stored frequency data.

(7) MEMO ENTER
The MEMO ENTER feature is effected by closing matrix R4-K1. This feature stores a displayed data into the internal memory.

- **Slide Switch Features**

(1) MODE switching
When the MODE switch is set at USB/CW or LSB, matrix R5-L4 is left open. The matrix is closed when the switch is set at the FM position. The microprocessor identifies the current operation mode (SSB or FM) from this matrix state and provides operation in the MEMO SCAN, MEMO RCL, or SCAN ALL mode.

(2) VFO selection
- S (Simplex) mode
  The matrix of R3—L4 is closed. The transmission frequency is the same as the reception one.
- R1 (Repeater 1) mode
  The matrix of R3—R8 is closed. The reception frequency is shifted up 600 kHz.

- **Other Features**

(1) Noise Blanker (NB)
The noise blanker is activated by closing matrix R4-K8. It is alternately activated each time the NB switch is depressed. The NB circuit is bypassed in the FM mode. If operation mode is switched from SSB into FM when the NB feature is activated, it is inactivated and is left inactive when the SSB mode is restored.

(2) Scan operation
When a signal is received during channel scanning in the FM mode, a potential is applied to pin 12 of analog switch QL04. This closes matrix R2-L8 to stop frequency scan.
When the signal is removed from the input, matrix R2-L8 is opened, and the microprocessor restarts channel scanning approximately 1.5 sec. later (BUSY operation). In the SSB mode, channel scanning is continued regardless of signal presence at the input.

(3) Switching between 5/25 kHz stepping intervals:
Switching between 5 and 25 kHz stepping intervals is controlled by SL01.
Closing matrix R2-L4 selects 5 kHz stepping interval.
Closing matrix R2-L4 selects 25 kHz stepping interval.

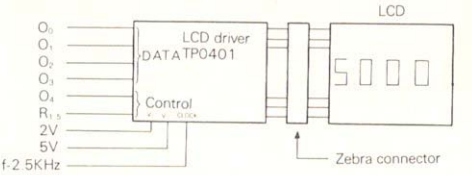
(4) HALT feature
The HALT feature is provided to reduce power dissipation from the microprocessor during memory back-up. When HIGH level is applied to the HALT terminal (pin 34), the microprocessor halts its operation to reduce current drain to approx. 40 μA.
The HALT feature is used for the following cases:

a. The microprocessor monitors the SW+B at its L1 input (pin 36). When the POWER switch is set to OFF and the input at L1 goes LOW, the back-up feature is activated. At the time, the microprocessor drops all its outputs (R0-R13, 00-07) to LOW and stops internal operation.
b. When the SW+B is set LOW, the HALT SW (QL05) is turned on. With a delay determined by time constant CL12, a HIGH level potential is applied to the HALT terminal to halt microprocessor operation.
c. When the POWER switch is set to ON and the SW+B is set to HIGH, QL05 is turned off and, at the same time, pins 8 and 9 of QL04 are closed. This instantly discharges the potential across CL12.
d. The potential at the HALT terminal goes low, and the SW+B is applied to L1. This restarts microprocessor operation.

(5) Control section in the TX mode
Input L2 (pin 37) of the microprocessor monitors the TX B. When the TX mode is effected and input L2 is set HIGH, the microprocessor holds all its outputs (R0-R13, 00-07) to DC level to ineffectuate all control IC inputs.

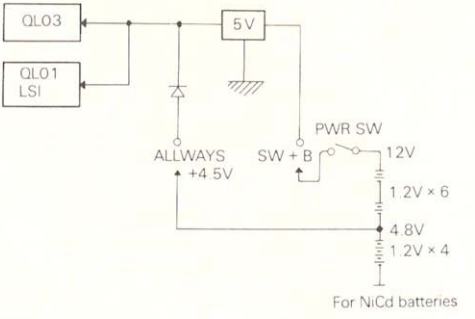
3. Display section

The display section consists of an LCD display and LCD driver. It accepts 4 data lines (O2, O3, O6, O7) and 2 control lines (O1, R11) from the microprocessor. V, Vss, and driving clock are also supplied to the driver. The driver provides the LCD display with a dynamic driving signal of 1/3 duty cycle. The dynamic display driving requires a clock.



4. Other controller peripheral circuitry

(1) Back-Up Circuit
When the POWER switch is set at ON, the power is supplied from a 3-pin regulator (QS09). When the POWER switch is set at OFF, the internal memory is backed up by the built-in battery power.
No back-up is provided if the battery is not installed.



(2) RESET circuit

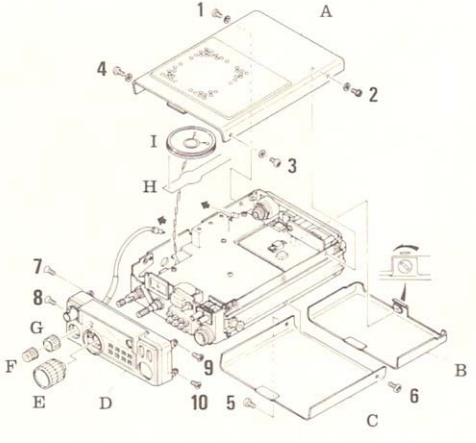
When a HIGH level signal is applied to the INT terminal (pin 35) of the microprocessor via the RESET switch contact, the entire microprocessor content including its memory is cleared.

1. DISASSEMBLING THE CASE OF THE UNIT

1) To remove the upper panel A, remove the four screws 1 through 4 holding it.
2) Remove the battery compartment B. This allows you to look the component parts of the C58.

NOTE:
In disassembling, care should be taken in the speaker (1) lead wires and other wires.

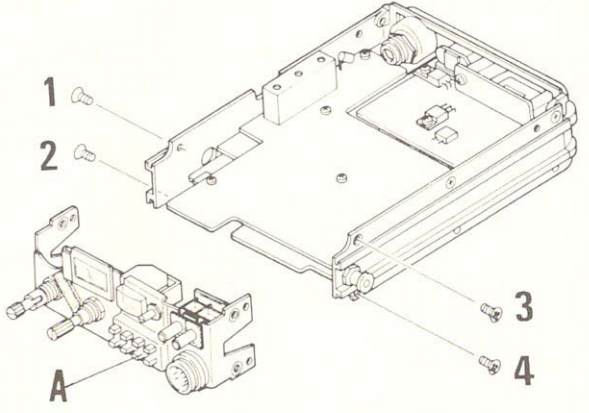
3) To remove the front panel D, pull the knobs E, F, and G backward for removal. Also, remove the four screws 7 through 10 holding the panel.
4) To replace, reverse Steps 1 through 3.



2. FRONT BRACKET

Remove the four screws 1 through 4 holding the front bracket A for separation from the chassis.

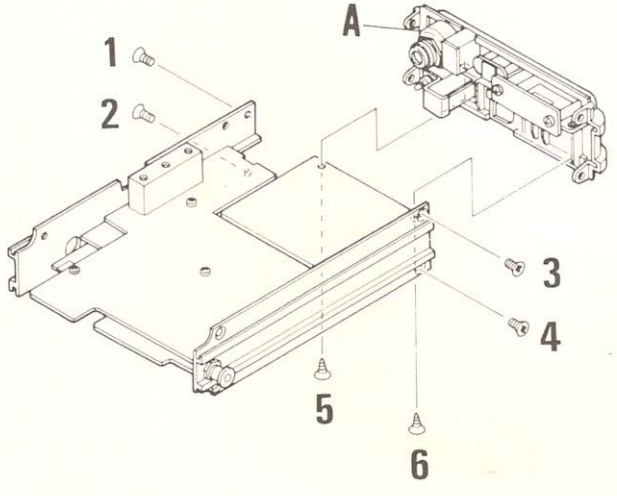
NOTE:
In separation, be careful not to damage any lead wire.



3. REAR PANEL

To remove the rear panel A, remove the six screws 1 through 6 holding it.

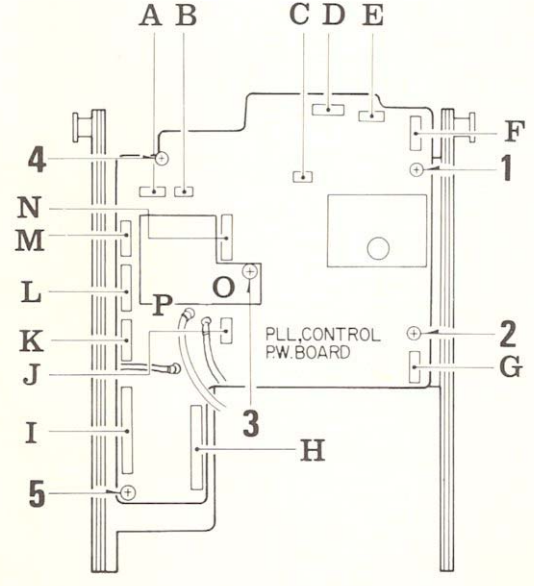
NOTE:
In separation, be careful not to damage any lead wire.



4. REMOVING PC BOARD ASSEMBLIES

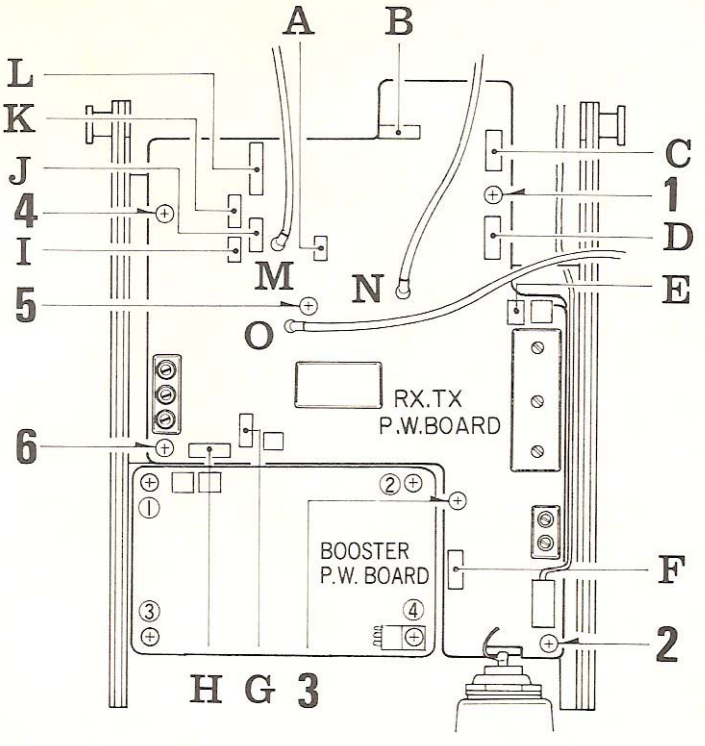
PLL, CONTROL BOARD

1) Disconnect the two coaxial cables P and O from the PLL control PW board.
2) Also, disconnect the thirteen connectors A through N.
3) Remove the five screws 1 through 5 holding the PW board for removal.
4) To reassemble, reverse Steps 1 through 4.

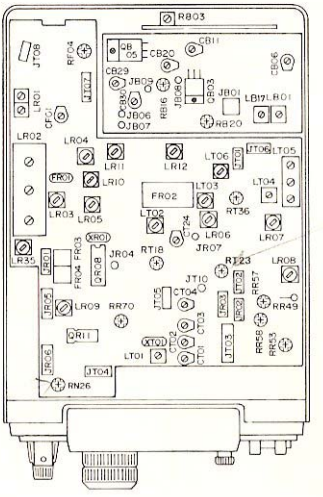


RX, TX BOARD

1) Disconnect the three coaxial cables M through O from the RX & TX PW board.
2) Also, disconnect the twelve connectors A through L.
3) Remove the six screws 1 through 6 holding the PW board for removal.
4) To reassemble, reverse Steps ① through ④.



TOP

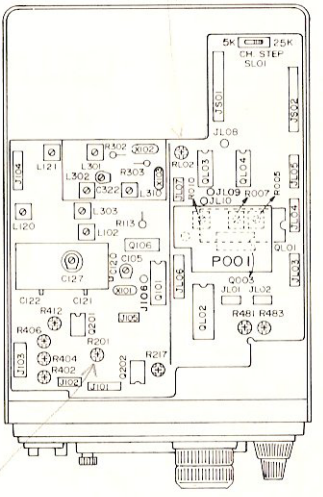


SSB MIC. AMP.

BUZZER LEVEL

LCD VSS ADJ.

BOTTOM



FM MIC. AMP.

ALIGNMENT PROCEDURE

CONDITIONS

* All adjustments have been completed prior to shipment. Further adjustments should be limited to a necessary minimum.
* Make sure that all measuring instruments required for alignment are completely calibrated and operate normally.
* Before starting measurement, idle the instruments for half-an-hour.

Required Measuring Instruments

1. UHF standard signal generator
2. RF power meter
3. Audio signal generator
4. AC/DC voltmeter (VTVM)
5. RF voltmeter
6. Frequency counter
7. Oscilloscope
8. Galvanometer
9. Regulated DC power supply
10. DC ammeter
11. (Spectrum analyzer)
12. (Digital voltmeter)

Required Alignment Tools

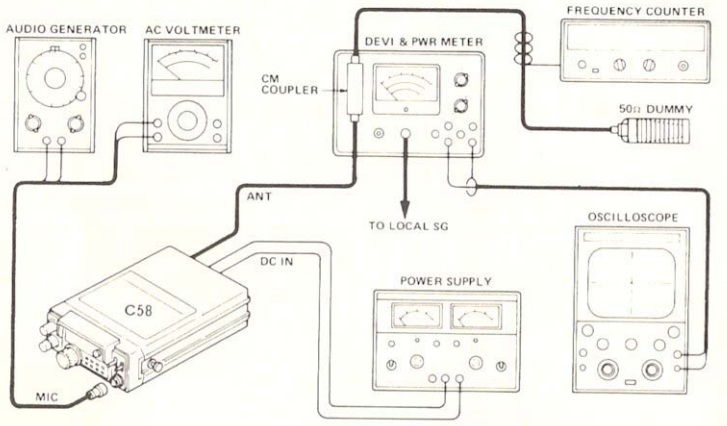
1. Philips screwdriver . . . for casing and boards
2. Standard screwdriver. . for trimmer resistor and IF adjustment
3. Non-metallic standard screwdriver . . . . . for RF and trimmer capacitor adjustment
4. Box screwdriver . . . . for support (2.6, 3.0mm)

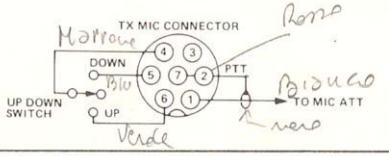
For RF circuit and frequency adjustment, use a non-metallic screwdriver.

Standard condition

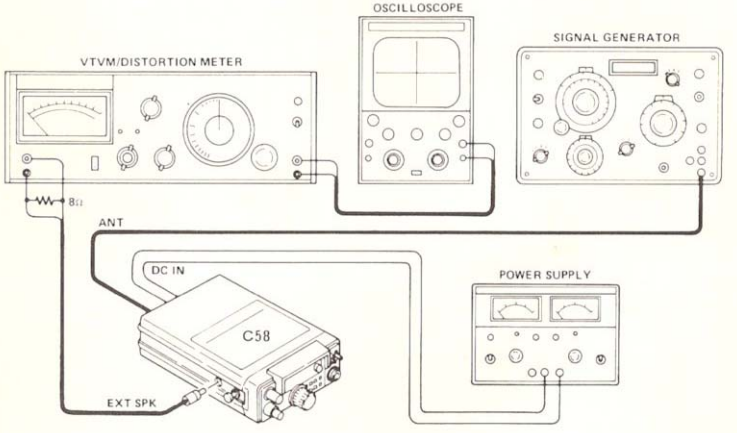
Supply voltage	13.8 V
Audio output	0.5 W
Audio output loading	8Ω
Deviation	±3 kHz
Transmitter load	50Ω
Reception frequency	145.900 MHz
Transmission frequency	146.000 MHz

TX ADJUSTMENT SET-UP





RX ADJUSTMENT SET-UP



1. LCD Supply Voltage Adjustment

- First, set RL02 to a mechanical center.
- Connect a digital voltmeter or high precision DC voltmeter positive lead (red) to pin 1 on JL07 and the negative lead (brown) to pin 2.
- Turn on the Power switch on the C58.
- Now, adjust RL02 until the voltmeter reads 3.0V.

2. PLL SECTION ALIGNMENT

(1) Shift voltage adjustment

- Set the MODE switch to FM and turn the RIT control to OFF.
- Set the receiver's tuning frequency to 145.000 MHz.
- Connect a precision DC voltmeter across R302, and adjust R406 until the voltmeter reads 4.00V.
- Set the MODE switch to LSB, and adjust the voltage across R302 to 4.00V with R404.
- Set the MODE switch to USB, and adjust the voltage across R302 to 4.00V with R402.

(2) Comparative oscillation adjustment

- Set the MODE switch to FM and set the reception frequency to 145.000 MHz.
- Connect a frequency counter to J106.
- Adjust C105 until the frequency counter reading is 5.120 MHz.

(3) Programmable counter input adjustment

- Set the MODE switch to FM. Set the reception frequency to 146.000 MHz.
- Connect an RF VTVM across R113. (a multimeter can be employed in place of the RF VTVM with use of an additional detector (rectifier) formed of a diode and capacitor.)
  Adjust L102, L302 and L303 until the maximum meter reading is obtained (approx. 400 mV).

  NOTE:
  When L102, L302 or L303 is replaced, perform the following presetting before making the above adjustment.

  L102: Turn slug clockwise by 3.5 turns.
  L302: Turn slug clockwise by 2 turns.
  L303: Turn slug clockwise by 2.5 turns.

(4) VCO Alignment

- Set the MODE switch to FM. Set the reception frequency to 145.000 MHz.
- Connect a precision DC voltmeter across C120. C120 (a capacitor placed through the shielding plate covered over the VCO board). Adjust C107 until the voltmeter reads 1.50V.

(5) Output alignment

- Set the MODE switch to FM, and the reception frequency to 146.000 MHz.
- Connect an RF VTVM to pin 1 (+) and pin 2 (–) of J104. (A multimeter can be employed in place of the RF VTVM with use of an additional detector (rectifier) formed of a diode and capacitor.) Adjust L120 and L121 until the maximum meter reading is obtained.

(6) Band A 100 Hz stepping alignment

- Set the MODE switch to FM.
- Connect a frequency counter across pins 1 and 2 of J104.
- Set the reception frequency to 145.0100 MHz, which is displayed as "5.01".
- Adjust L310 (coarse) and R406 (fine) until the frequency counter reading is 134,310,000 Hz.
- Set the reception frequency to 145.0099 MHz, which is displayed as ":0099". Adjust R481 until the frequency counter reading is 134,309,900 Hz.

(7) Band B 100 Hz stepping alignment

- Set the reception frequency to 145.005 MHz, which is displayed as ":0050" or "5.005".
- Set the MODE switch to FM.
- Read the frequency counter connected to J104. For example, it may be 134,305,020 Hz, not always 134,305,000 Hz. If it deviates more than 500 Hz, misalignment or defective VXO circuit part can be suspected.
- Set the reception frequency to 146.010 MHz, which is displayed as "6.010", leaving the MODE switch in FM.
- Preset C322 (a 10 pF trimmer capacitor) to its mechanical center.
- Adjust L310 (coarse) and C322 (fine) until the frequency counter reads 135,310,000 Hz.
- In turn, set the reception frequency to 146.0099 MHz, which is displayed as ".0099".
- Adjust R483 until the frequency counter reads 135,309,900 Hz.
- Set the reception frequency to 146.005 MHz, which is displayed as ":6.005" or "6.005".
- Read the frequency counter with the transceiver in the FM mode and make certain that the frequency is within ±500 Hz.

(8) Output frequency adjustment

- In turn, set the reception frequency to 145.000 MHz. Also, turn the MODE switch to LSB.

- Precisely adjust R404 until the frequency counter reads 1.5 kHz lower than the frequency in the FM mode.
- In turn, set the MODE switch to USB.
- Similarly adjust R402 until the frequency counter reads 1.5 kHz higher than the frequency in the FM mode.
- Set the reception frequency to 146.000 MHz and make certain that the frequency in the LSB mode in 1.5 kHz lower than the one in the FM mode and that in the USB is 1.5 kHz higher.

NOTE:
The frequency difference may not always be ±1.5 kHz, because ±1.5 kHz shift adjustment is made in the band A.

(9) **RIT Alignment**
- Leave the frequency counter connected to J104.
- Turn the RIT control to position "0". Set up the transceiver for the transmission mode, and read the frequency counter readout.
- Set up the transceiver for the reception mode, and adjust R412 until a frequency reading identical to that in the transmission mode is obtained.
- Turn the RIT control over its full rotation span to check that a frequency variation of more than 1 kHz is obtained.

TRANSMITTER SECTION ALIGNMENT

(1) **Subcarrier frequency alignment**
Connect a standard 3.5 mm plug as shown below to the rear KEY jack on the transceiver.

- Solder one end of a capacitor (5~20 pF) to RR49 (470Ω), and connect a frequency counter to RR49 via this capacitor.

NOTE:
To prevent measurement error use as small a capacitor as possible;

- Set the mode switch to FM and CT01 to its mechanical center. Set up the unit for the transmission mode. Adjust LT01 until the frequency counter reading is 10.700 MHz.
- Set the MODE switch to LSB, and adjust CT02 until the frequency counter reading is 10.7015 MHz.
- In turn, set the MODE switch to USB. Adjust CT03 until the frequency counter reading is 10.6993 MHz.
- With the MODE switch USB. Adjust CT04 until the frequency counter reading is 10.6985 MHz.
- Check the above adjustment steps again.
- Disconnect the plug form the rear KEY jack.

(2) **Younger adjustment**
- Set th MODE switch to FM and transmission frequency to 146.000 MHz.
- Connect an RF VTVM across pins 1 (+) and 2 (-) of JT06, and insert the plug used in the preceding step into the rear KEY jack.
- Connect a DC voltmeter across the sources of QT08 and QT09, and set up the unit for transmission mode. Adjust RT36 until the voltmeter reading is ±0V.

NOTE:
This adjustment is required only after part replacement. Never try otherwise.

- Adjust LT02, LT03, LR06, LT04 and LT05 until the maximum reading is obtained in the RF VTVM. Repeat this adjustment step a few times.
- Disconnect the plug from the KEY jack.

NOTE:
After adjusting LT03 and LR06, be sure to adjust the receiver sensitivity.

(3) Linear amplifier adjustment

- Set the MODE switch either to USB. or LSB.
- Disconnect the lead which connects between JB09 and LB12.
- Connect an ammeter between JB09 and LB12.
- Set up the unit for transmission mode (non modulation), and adjust RB16 until the ammeter reading is 30 mA.

NOTE:
This adjustment is required only after part replacement.

- After completing adjustment, restore the original connection between JB09 and LB12.
- Set CB06, CB11, CB19, CB29, CB30 and CF01 to their mechanical centers. Also, turn RB20 fully counterclockwise.
  Further, turn the output slug of LT05 down (the slug is located near JT06).
- Set the transmission frequency to 146.000 MHz.
- Set up the unit for transmission mode.
- Adjust LT06, LR06, two input slubs of LT05, LB17, LB01, CB06, CB11, CB19, CB29, CB30 and CF01 in the order in which they are written until the maximum transmission power is obtained. Repeat this adjustment a few times.

NOTE:
Observe the adjustment order.

- In turn, set the transmission frequency to 147.000 MHz, and adjust the three slubs of LT05 from input to output until the highest transmission power is obtained. Repeat this a few times.
- Make certain that the transmission power level at the extreme low frequency of 144.000 MHz is approximate to the one at the extreme high frequency of 147.995 MHz. If the level difference is not allowable, adjust CB17 and LB01 for good level balance.
- Adjust RB20 until the transmission power is 1.3 W.

(4) Deviation/SSB Transmission power alignment

a. Set the MODE switch to FM.
- Apply an audio frequency signal of 1 kHz, 30mV across terminals pin 1 (HOT) and pin 7 (GND) of the MIC jack.
- Set up the unit for transmission mode, and adjust R217 until ±5 kHz of deviation is obtained.
- Reduce the audio signal level by 20 dB to 3 mV (1 kHz), and adjust R201 until deviation of ±3.5 kHz is obtained.
- In turn, proceed with tone burst adjustment as follows. Depress the CALL key, and adjust R010 until the tone dviation is 3.5 kHz.
- Adjust R007 until the tone frequency is 1,750 Hz.

b. Set the MODE switch to USB.
- Couple an audio signal of 1 kHz, 5 mV across the MIC input.
- Set up the unit for transmission mode, and adjust RT23 until 1.0W of transmission power is obtained.

NOTE:
SSB transmission power adjustment should be done after completing FM deviation adjustment.

(5) SSB Carrier suppression alignment

- Set the MODE switch to LSB, and set up the unit for transmission mode (non-modulation).
- Set CT24 to its mechanical center.
- While viewing a spectrum analyzer, adjust RF output to minimum with RT18. Then adjust CT24 until the minimum RF output is obtained.
- Repeat the adjustment by RT18 and CT24 a few times.
- If carrier suppression ratio is still 40 dB smaller than 1.3 W, repeat the above adjustment steps again.
- In turn, set the MODE switch to USB and similarly proceed with adjustment. (Carrier suppression must be greater than 40 dB for both LSB and USB.)

NOTE:
In adjustment, full attention should be taken as the carrier suppression may change critically.

RECEIVER SECTION ALIGNMENT

(6) RF output power and battery check meter alignment

- Set the MODE switch to FM, and set up the C58 for the transmission mode.
- Make certain that the transmission RF output power is 1.3 W.
- Now, adjust RF04 until the meter pointer deflects to the +20 dB mark.

NOTE:
1. **If the meter pointer deflection is too small to adjust RF04, then being LF03 and LF07 closer. If too large, on the contrary, bring them away.**

2. **The meter is misaligned with it adjusted as the S meter in the reception mode. The adjustment for the meter as the RF output power meter must be completed after it has been adjusted as the S meter in the reception mode.**
3. **Moving LF03 and LF07 or opening the TX & RX PW board could cause misalignment of the meter. In such a case, readjustment must be made.**

- In turn, set the LIGHT/BAT CHECK switch to the BAT CHECK position.
- Set the voltage regulator output to 9.6 V.
- Adjust R803 until the meter pointer is at the boundary of the red and green zones.

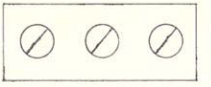
(1) SSB sensitivity adjustment

- Set the slubs of the antenna coil LR02 as follows.
  a. Turn the screw of the 1st stage 1/2 turn counterclockwise.
  b. Also, turn the screw of the 3rd stage 5 turns counterclockwise.

NOTE:

1. **This adjustment is required only after part replacement.**
2. **Each slub does not move up and down. Its correct setting cannot be found if turned with no care.**

- Turn RN26 (semi-fixed, CW tone and buzzer output control) fully clockwise.
- Set the MODE switch to USB.
- Set the reception frequency to 144.00 MHz.
- Turn the output side slub of LR01 to lower down.
- Set up the C58 so as to receive a 144.00 MHz nonmodulated wave from the RF signal generator.
- Adjust the RIT control so that a 1 kHz signal output can be obtained. Make certain the frequency in a Lissajous waveform way.
- Set RR53 to its mechanical center.
- Adjust LR01, LR03, LR04, LR05, LT03, LR06, LR07 and LR08 in this order a few times each until a highest audio signal level is obtained. Whenever adjusting each control, adjust RF signal generator output level until the audio signal-to-noise ratio is around 10 dB. (Care should be taken not to saturate the audio signal output.)
- In turn, set the reception frequency to 146.00 MHz and adjust the LR02 slubs in the order shown below until a highest audio signal level is obtained. Repeat this adjustment a few times.



Adjustment order:
3 , 1 , 2 , 3 ,..

In adjustment, also, adjustment should be made for the audio signal-to-noise ratio and saturation.

- In turn, set the RF signal generator output level to 80 dB.
- Adjust the VOL control until 1V audio signal output is obtained. The 1V level should be 0 dB as reference.
- Also, adjust the attenuator until the audio signal output is -3 dB.
- Turn the VOL control fully clockwise (maximum audio signal output).
- Now, adjust RR53 until the audio signal output is 1.5W, or 3.46V across 8Ω load.

(2) FM Sensitivity adjustment

- Set the MODE switch to FM, and the RIT control to OFF.
- Set up the signal generator output for 1 kHz modulation with ±3.5 kHz deviation. (at 145.900 MHz)
- Adjust LR09 until the maximum audible output is obtained from the speaker (with 60 dB input).
- Turn the VOL control on the C58 fully clockwise, and adjust RR70 until the audio output across the speaker terminals is 1.5W (3.5V across 8Ω load).

(3) Noise blanker alignment

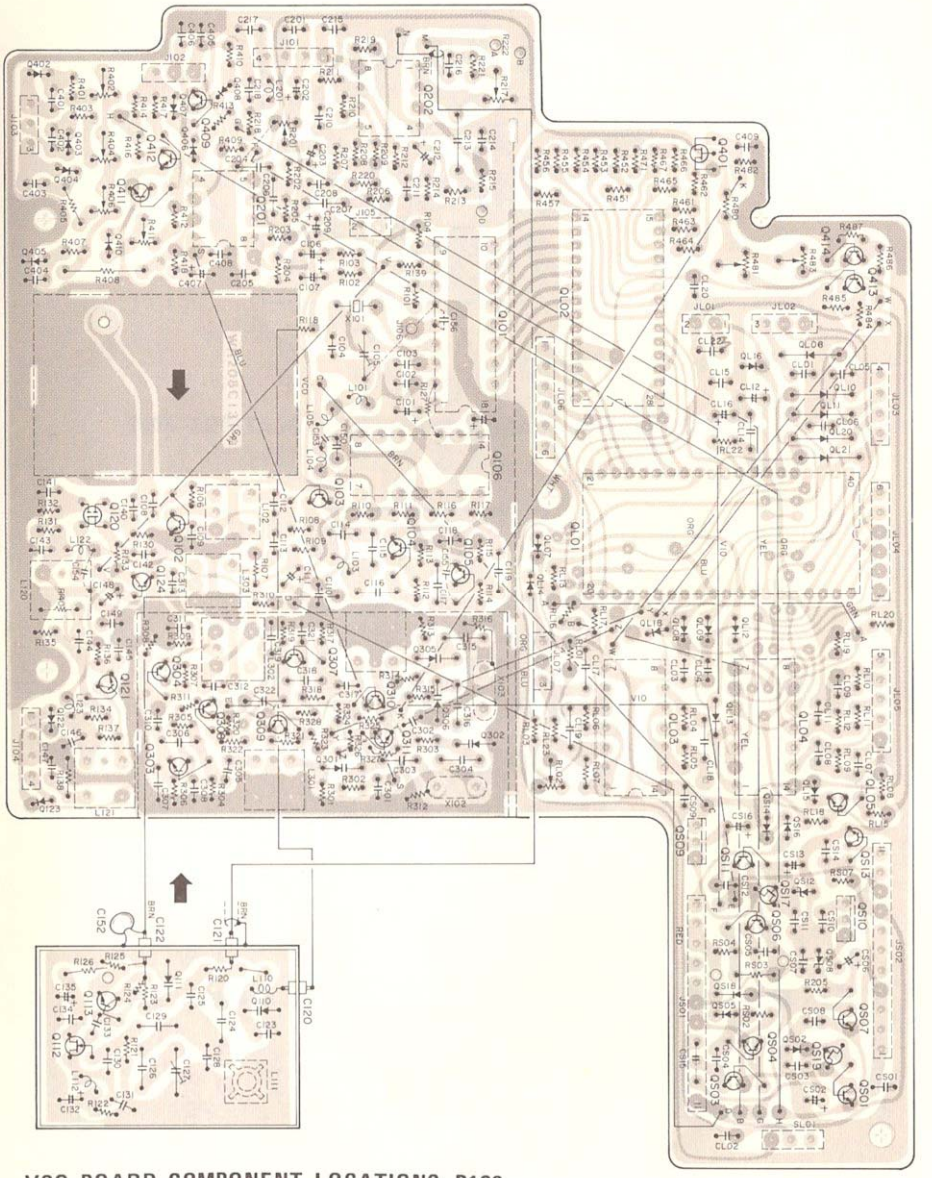
- After completing sensitivity adjustment, set the NB switch to ON.
- Set the MODE switch to USB, and apply no signal input from the RF signal generator.
- Connect a voltmeter across the QN06 base and RN15, and adjust LN01, LN02 and LN03 until the maximum signal amplitude is obtained on the oscilloscope.

(4) **S Meter adjustment**

- Set the MODE switch to USB.
- With no signal input applied (inter-station noise being received), adjust RR57 until the S meter pointer is between "S" and "1" on the meter scale.
- With the output attenuator on the RF signal generator set at +20 dB, apply its output to the ANT terminal on the C58. Adjust RR58 until the S meter pointer indicates "9" on the meter scale.
- Repeat the above adjustment and make certain that the meter indicates "1" for no input signal and "9" for 20 dB input signal.

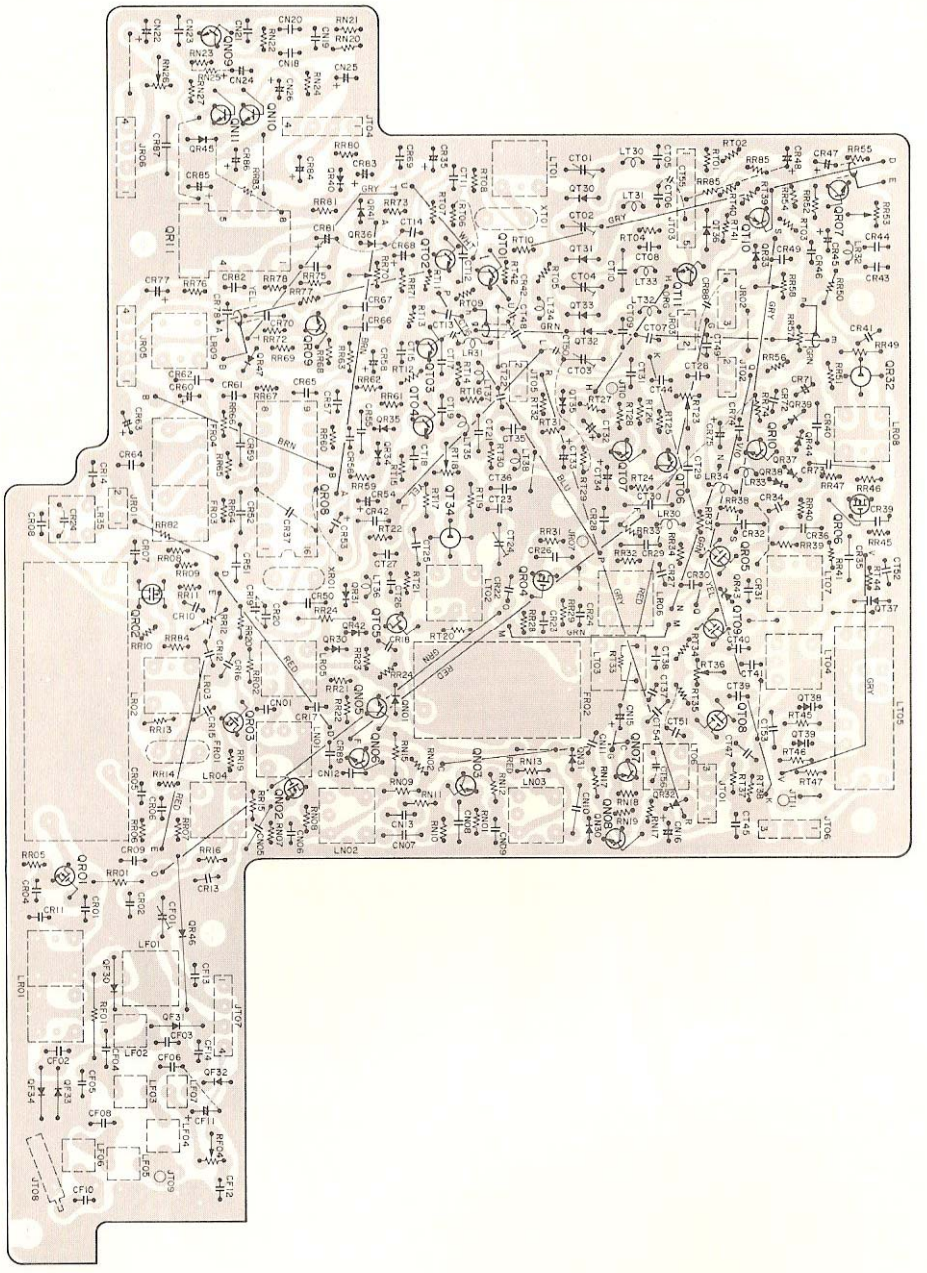
NOTE:
After adjusting the S meter, ensure to adjust the RF output power meter as well.

PLL BOARD COMPONENT LOCATIONS–P101

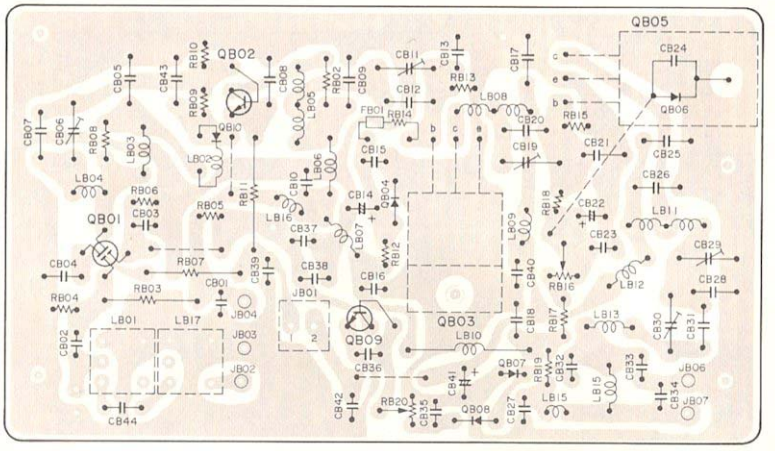


VCO BOARD COMPONENT LOCATIONS–P120

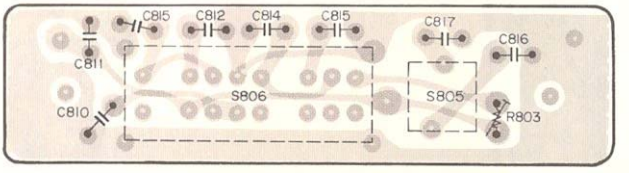
RX AND TX BOARD COMPONENT LOCATIONS–PR01



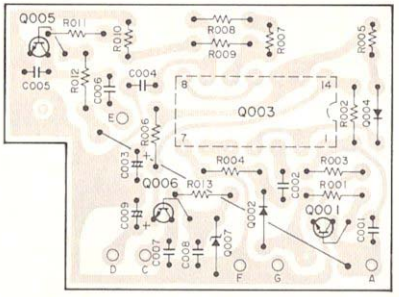
RF POWER AMPLIFIER BOARD COMPONENT LOCATIONS–PB01



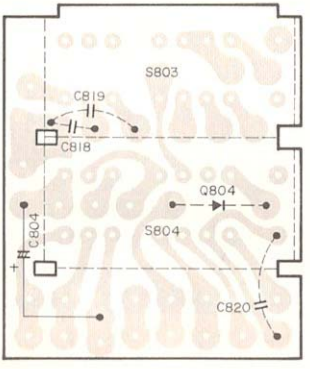
REAR SWITCH BOARD COMPONENT LOCATIONS–P803



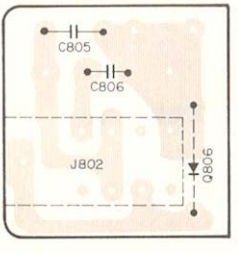
TONE BURST BOARD COMPONENT LOCATIONS–P001

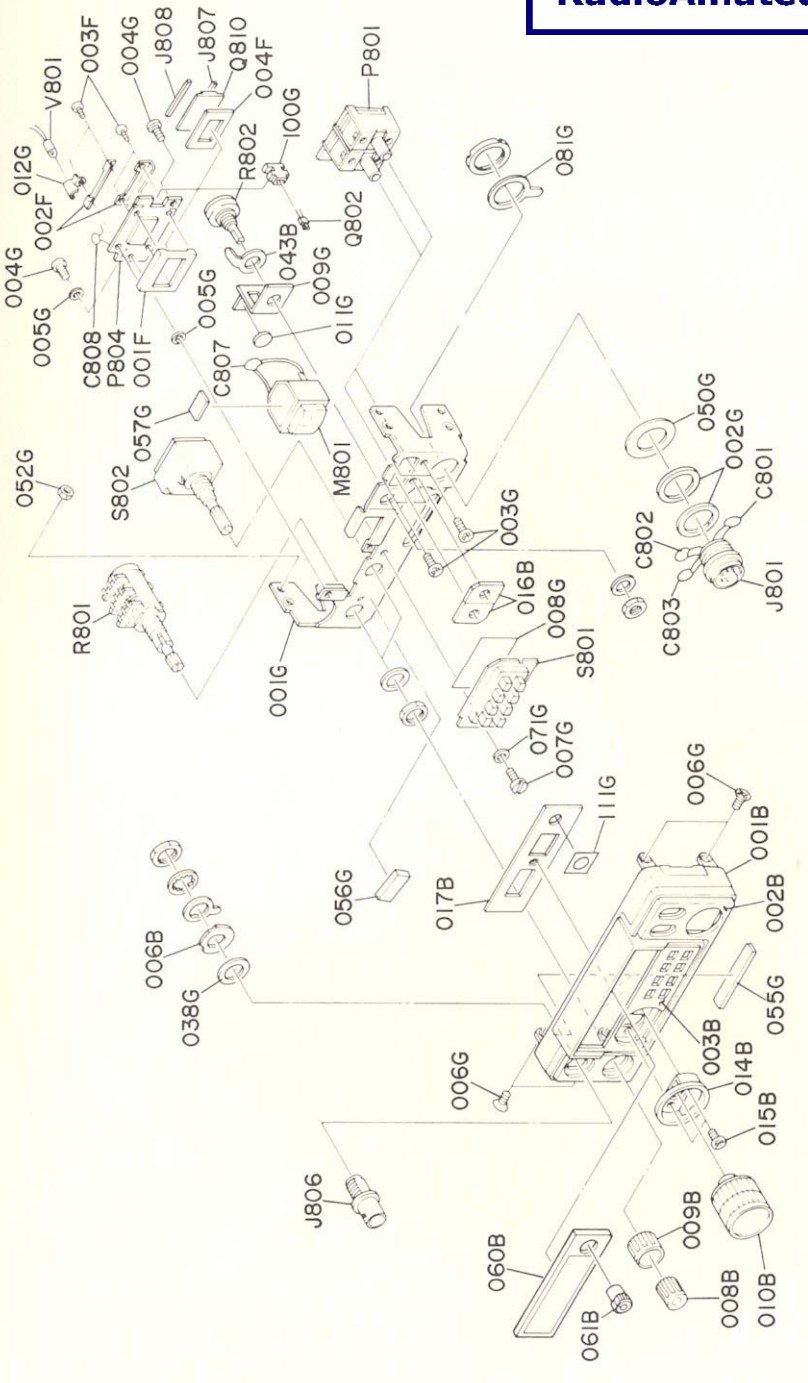


FUNCTION SWITCH BOARD COMPONENTS LOCATIONS–P801



EXT. POWER SWITCH BOARD COMPONENT LOCATIONS–P802

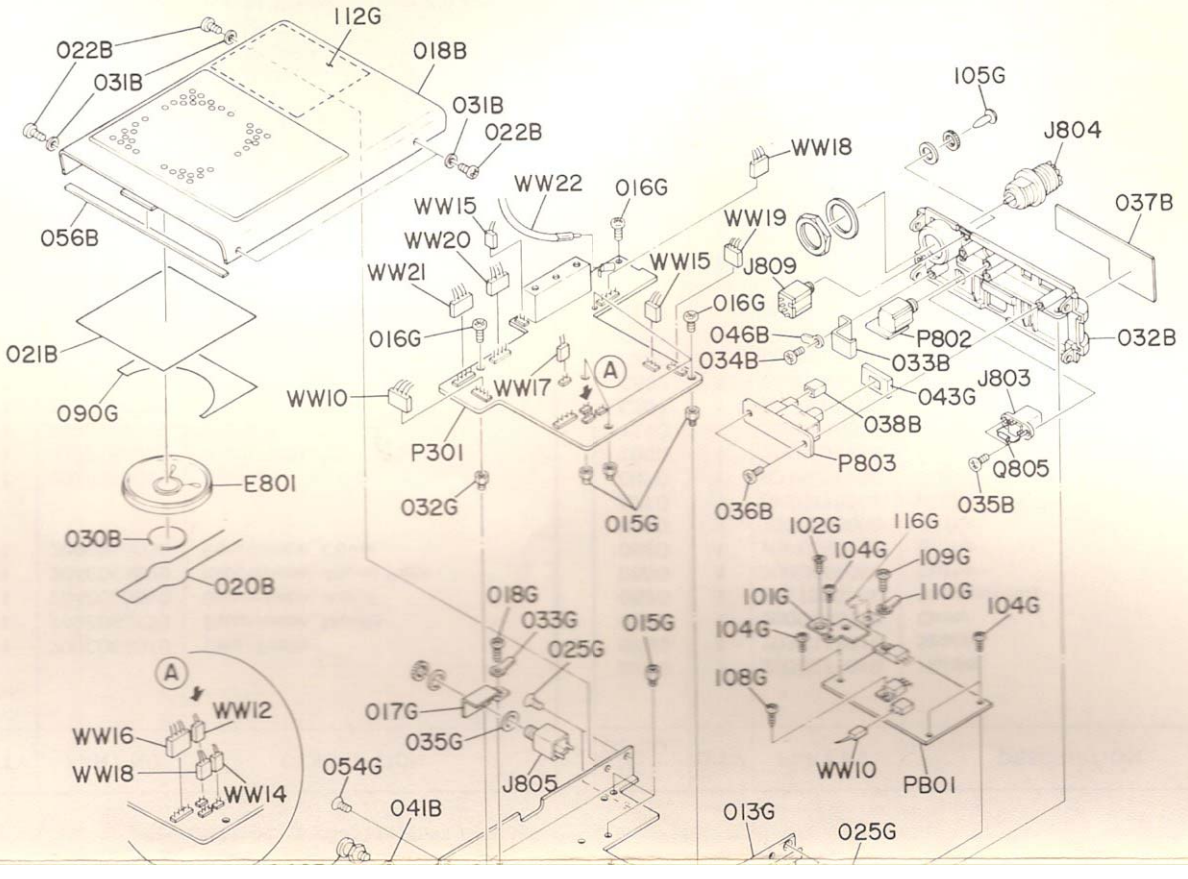




[P01-99] ESCUTCHEON RERATED

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
001B	1	200C064010	Case, Front
002B	1	203C063120	Escutcheon, Mould
003B	1	204C063010	Escutcheon, Acryl
017B	1	204C063020	Escutcheon, Alumi Plate
060B	1	204C063030	Escutcheon, Cover
006B	1	203C114010	Stopper
008B	1	4723154020	Knob, VOL
009B	1	4723154030	Knob, SQL
010B	1	200C154500	Knob, Channel
014B	1	200C353010	Ring
015B	2	51100205E0	B.H.M. Screw B2 x 5
016B	2	200C118010	Spacer
043B	1	62062060W0	Lug
061B	1	204C154010	Knob, RIT
001F	1	200C064060	Case, LCD
002F	2	200C005040	Clamper
003F	4	51400019K0	B.H. Tapped Screw B1 x 9
004F	1	200C053030	Cover
001G	1	204C105010	Chassis, Front
002G	2	200C118050	Spacer
003G	2	51062603A0	P.H.M. Screw P2.6 x 3
004G	2	51060203A0	P.H.M. Screw P2 x 3
005G	2	59020403G0	Washer
006G	4	51042604A0	F.H.M. Screw F2.6 x 4
007G	1	200C005030	Clamper
008G	1	4723120050	Insulator
009G	1	204C005010	Clamper
011G	1	200C056030	Buffer

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
012G	1	200C271010	Holder
038G	1	203C118010	Spacer
050G	1	200C053020	Cover
052G	1	53112603A0	Hexagon Nut
055G	1	200C056060	Buffer
056G	1	200C056070	Buffer
057G	1	200C056080	Buffer
071G	1	59264702G9	Washer
081G	1	62150019E0	Lug
100G	1	204C271010	Holder, TX LED
111G	1	204C118010	Spacer
C801	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C802	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C803	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C807	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C808	1	DD15300370	Ceramic Cap. 30pF ±5%
J801	1	YJ10001250	Jack, Mic (7P)
J806	1	YJ10001620	Jack, Ant.
J807	1	YJ90000280	Jack, LCD Connector
J808	1	YJ90000280	Jack, LCD Connector
M801	1	IM11020040	D.C. Meter
Q802	1	HI10025020	L.E.D. LN222RP (Red)
Q810	1	HQ20401440	Display Unit
R801	1	BP12030030	VR-SW Component
R802	1	RB11020010	Variable Resistor 1KΩ(B)
S801	1	SK08080012	Keyboard Switch, 8 Key
S802	1	SR18020010	Rotary Switch, 18 Position
V801	1	IN10140080	Lamp, 40mA 14V
K801	1	KZ03001440	LCD Kit
P804	1	YF200C0030	P.W. Board LCD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018B
031B
031B
022B
105G
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WW22
016G
WW15
WW20
WW19
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WW21
WW15
J809
016G
016G
046B
P802
032B
021B
034B
033B
J803
WW10
WW17
043G
090G
038B
P301
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Q805
E801
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015G
036B
035B
102G
116G
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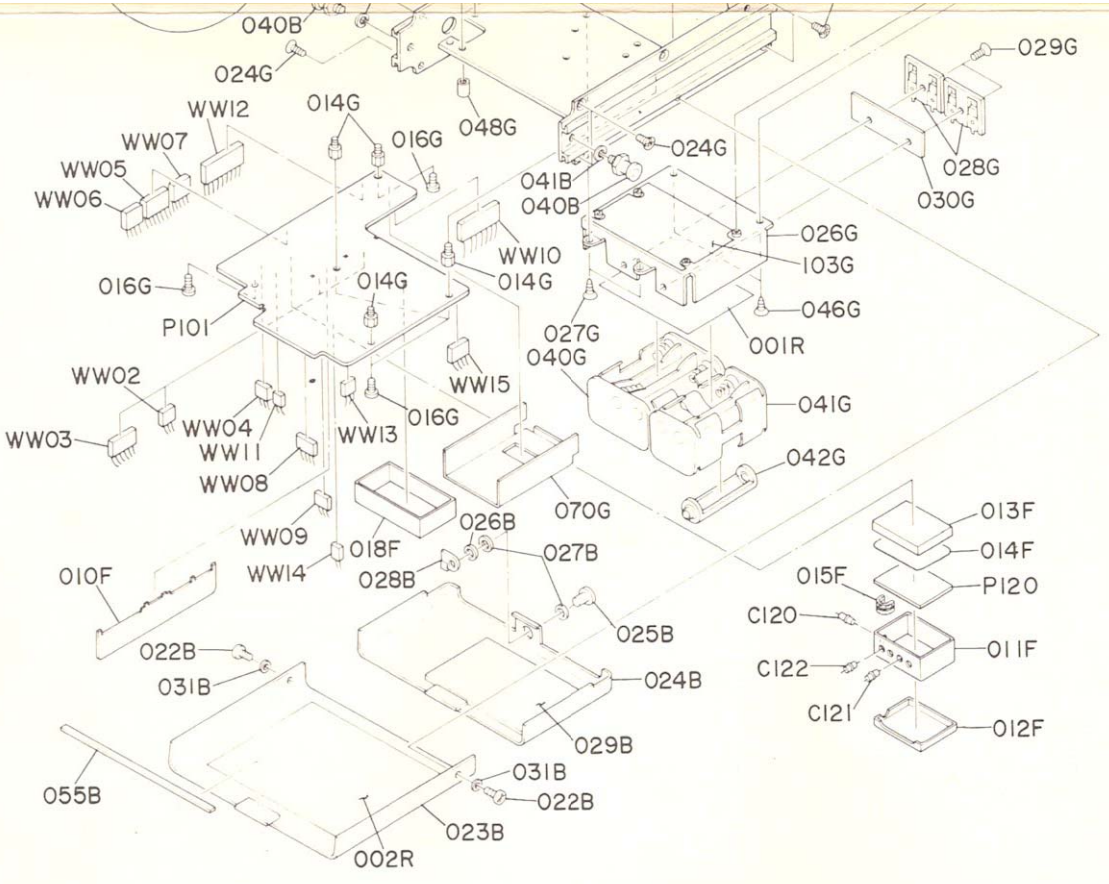
013G
025G


040B
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WW12
014G
048G
WW07
016G
024G
028G
WW05
041B
030G
WW06
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WW10
103G
016G
014G
014G
046G
P101
027G
001R
040G
WW02
WW15
041G
WW04
016G
WW03
WW13
WW11
042G
WW08
070G
013F
WW09
026B
014F
010F
WW14
018F
028B
027B
015F
P120
C120
025B
011F
022B
C122
031B
024B
C121
012F
029B
031B
055B
022B
023B
002R

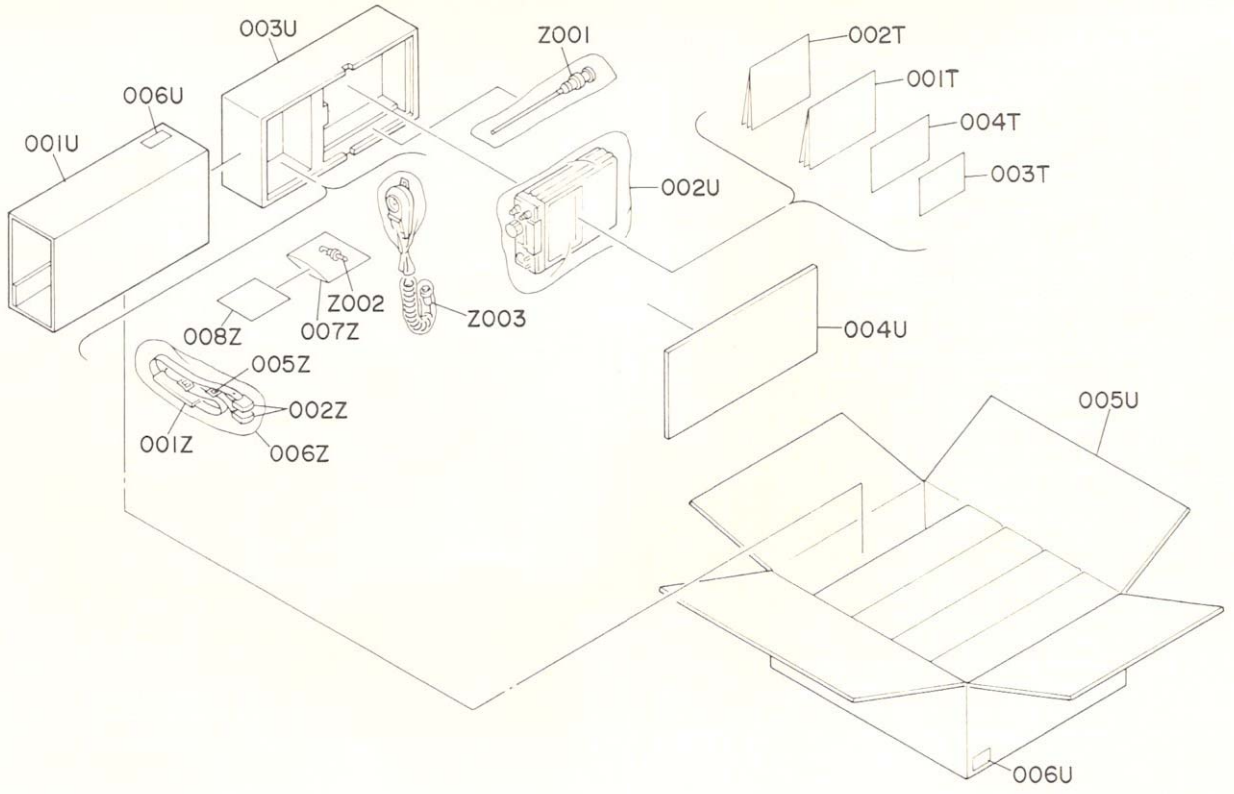
REF. DESIG.	Q'TY	PART NO.	DESCRIPTION	
024B	1	200C257030	Lid, Battery Case	
025B	1	200C102030	Lock, Coin	
026B	1	200C055010	Collar	
027B	2	59069505G9	Washer	
028B	1	200C102040	Lock	
016B	2	200C118010	Spacer	
018B	1	204C257010	Lid, Upper Case	
020B	1	204C115010	Spring	
021B	1	204C053010	Cover	
022B	6	51282606U0	B.H. Tapped Screw	B2.6 x 6
023B	1	200C257020	Lid, Bottom Case	
029B	1	200C056020	Buffer	
030B	1	200C120060	Insulator	
031B	6	54012600A0	Flat Washer, S.	
032B	1	200C064220	Case, Rear	
033B	1	200C005020	Clamper	
034B	1	51102604E0	B.H.M. Screw	B2.6 x 4
035B	2	51100204E0	B.H.M. Screw	B2 x 4
036B	2	51102604E0	B.H.M. Screw	B2.6 x 4
037B	1	200C265220	Indicator	
038B	1	200C270010	Button, Reset	
040B	2	200C155010	Hanger	
041B	2	54040402B0	Spring Washer	
046B	1	62261240W0	Lug	
055B	1	200C118040	Spacer	
056B	1	200C118040	Spacer	

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION	
010F	1	203C109050	Shield	
011F	1	203C109040	Shield, VCO Frame	
012F	1	203C109060	Shield	
013F	1	4723109240	Shield	
014F	1	4723120020	Insulator	
015F	1	1143259010	Bushing	
018F	1	205C109050	Shield	
013G	1	200C105210	Chassis, H	
014G	4	200C101010	Support	
015G	4	200C101020	Support	
016G	10	51442605A0	B.H.M. Screw	B2.6 x 5
017G	1	204C160010	Bracket	
018G	1	51280305B0	B.H. Tapped Screw	B3 x 5
024G	3	51042604A0	F.H.M. Screw	F2.6 x 4
025G	4	51042604A0	F.H.M. Screw	F2.6 x 4
026G	1	200C064210	Case, Battery Tray	
027G	2	51342605P0	F.H. Tapped Screw	F2.6 x 5
019G	1	51102604A0	B. H. M Screw	B2.6 x 4
028G	2	200C123110	Contactor	
029G	2	51342605P0	F.H. Tapped Screw	F2.6 x 5
030G	1	200C120040	Insulator	
032G	1	204C101020	Support	
033G	1	62030039W0	Lug	
035G	1	200C118030	Spacer	
040G	1	200C064040	Case, Battery (6 Pieces)	
041G	1	200C064050	Case, Battery (4 Pieces)	
042G	1	200C121010	Link, Dummy	
043G	1	200C118020	Spacer	
120G	1	208C101010	Support	
121G	1	208C056010	Buffer	
122G	1	208C118010	Spacer	
117G	1	200C101040	Support	

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
046G	2	51342605P0	F.H. Tapped Screw F2.6 x 5
048G	1	204C101010	Support
054G	1	51042606A0	F.H.M. Screw F2.6 x 5
070G	1	200C053130	Cover
090G	1	204C053020	Cover
101G	1	204C267010	Heatsink
102G	1	51042605A0	F.H.M. Screw F2.6 x 5
103G	1	204C120010	Insulator
104G	3	51100205E0	B.H.M. Screw B2 x 5
105G	1	2991259010	Bushing
	1		
	1		
108G	1	51282605B0	B.H. Tapped Screw B2.6 x 5
109G	1	51100305A9	B.H.M. Screw B3 x 5
110G	1	62031340W0	Lug
112G	1	204C120020	Insulator
	1		
001R	1	200C861110	Label, Batt. Ind.
002R	1	208C861010	Label, Test Point
E801	1	QK00578010	Speaker 57mm 8Ω
J803	1	YJ04000620	Jack, Charger
J804	1	YJ10000550	Jack, Antenna
J805	1	YJ01000570	Jack, EXT Speaker
J809	1	YJ01001500	Jack, CW Key
Q805	1	HD20001100	Diode 10D-2

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
WW02	1	YB01001340	Connective Cord
WW03	1	YB01001350	Connective Cord
WW04	1	YB01001170	Connective Cord
WW05	1	YB01001360	Connective Cord
WW06	1	YB01001370	Connective Cord
WW07	1	YB01001380	Connective Cord
WW08	1	YB01001390	Connective Cord
WW09	1	YB01001400	Connective Cord
WW10	1	YB01001410	Connective Cord
WW11	1	YB01001430	Connective Cord
WW12	1	YB01001420	Connective Cord
WW13	1	YB01001440	Connective Cord
WW14	1	YB01001450	Connective Cord
WW15	1	YB01001460	Connective Cord
WW16	1	YB01001470	Connective Cord
WW17	1	YB01001510	Connective Cord
WW18	1	YB01001480	Connective Cord
WW19	1	YB00050080	Connective Cord
WW20	1	YB01001500	Connective Cord
WW21	1	YB01001520	Connective Cord
WW22	1	YB01001080	Connective Cord
WW23	1	YB01001550	Connective Cord
WW24	1	YB01001560	Connective Cord
WW25	1	YB01001570	Connective Cord
WW26	1	YB00280070	Connective Cord

PACKAGING


003U
Z001
002T
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006U
001U
002U
Z002
Z003
008Z
007Z
004U
005Z
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006Z
005U
006U

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
001T	1	208C851010	Instructions
002T	1	208C856010	Circuit Diagram
001U	1	204C804020	Packing Case
002U	1	9012035010	Polyethylene Bag
003U	1	200C809010	Cushion
004U	1	200C803010	Partitioner
005U	1	204C805020	Master Carton
006U	3	9523019020	Serial No. Card

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
001Z	1	4223156010	Strap
002Z	2	200C155500	Hanger, (K)
005Z	1	200C155020	Hanger, Mic
006Z	1	9011020010	Polyethylene Bag
007Z	1	9010510010	Polyethylene Bag
008Z	1	208C851010	Instructions
Z001	1	YR99020060	Whip Antenna
Z002	1	YP01000310	Plug, Non Short
Z003	1	MP11000690	Microphone

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
			P101-PLL CIRCUIT BOARD
P101	1	WH208C1310	P.W. Board, PLL
			P101-CAPACITORS
CL01	1	DD15220370	Ceramic 22pF ±5%
CL02	1	DD15220370	Ceramic 22pF ±5%
CL03	1	DD15220370	Ceramic 22pF ±5%
CL04	1	DD15220370	Ceramic 22pF ±5%
CL05	1	DD15220370	Ceramic 22pF ±5%
CL06	1	DD15220370	Ceramic 22pF ±5%
CL07	1	DK16102300	Ceramic 0.001μF ±10%
CL08	1	DK16102300	Ceramic 0.001μF ±10%
CL09	1	DK16102300	Ceramic 0.001μF ±10%
CL11	1	DK16102300	Ceramic 0.001μF ±10%
CL12	1	EV22403560	Elect 0.2μF 35V
CL13	1	EV10502560	Elect 1μF 25V
CL14	1	DD15470300	Ceramic 47pF ±5%
CL15	1	DK18103030	Ceramic 0.01μF
CL16	1	EJ10601610	Elect 10μF 16V
CL17	1	DS17822010	Semicon 8200pF ±20%
CL18	1	DS17153010	Semicon 0.015μF ±20%
CL19	1	DS17153010	Semicon 0.015μF ±20%
CL20	1	DK18103030	Ceramic 0.01μF
CL22	1	DK18223320	Ceramic 0.022μF
CS01	1	DK18103030	Ceramic 0.01μF
CS02	1	EA10601630	Elect 10μF 16V
CS03	1	DK16102300	Ceramic 0.001μF ±10%
CS04	1	DK18103030	Ceramic 0.01μF
CS05	1	DK18103030	Ceramic 0.01μF
CS06	1	EJ10505010	Elect 1μF 50V
CS07	1	DK16102300	Ceramic 0.001μF ±10%
CS08	1	DK18103030	Ceramic 0.01μF
CS09	1	DK18103030	Ceramic 0.01μF

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
CS10	1	DK18103030	Ceramic 0.01μF
CS11	1	DK16102300	Ceramic 0.001μF ±10%
CS12	1	DK18103030	Ceramic 0.01μF
CS13	1	EA10602530	Elect 10μF 25V
CS14	1	DK16102300	Ceramic 0.001μF ±10%
CS15	1	DK18103030	Ceramic 0.001μF
CS16	1	EA47502530	Elect 4.7μF 25V
C101	1	EV10601060	Elect 10μF 10V
C102	1	DK16102300	Ceramic 0.001μF ±10%
C103	1	DD15330300	Ceramic 33pF ±5%
C104	1	DD15200300	Ceramic 20pF ±5%
C105	1	CT12000090	Trimming 20pF
C106	1	EV33501060	Elect 3.3μF 10V
C107	1	EV10403560	Elect 0.1μF 35V
C108	1	DD10020300	Ceramic 2pF ±0.25pF
C109	1	DK16102300	Ceramic 0.001μF ±10%
C110	1	DK16102300	Ceramic 0.001μF ±10%
C111	1	EA47601030	Elect 47μF 10V
C112	1	DD10050300	Ceramic 5pF ±0.25pF
C113	1	DD10050300	Ceramic 5pF ±0.25pF
C114	1	DD15270300	Ceramic 27pF ±5%
C115	1	DD15270300	Ceramic 27pF ±5%
C116	1	DD15101350	Ceramic 100pF ±5%
C117	1	DD15101350	Ceramic 100pF ±5%
C118	1	DK18103030	Ceramic 0.01μF ±5%
C119	1	DK18203030	Ceramic 0.02μF
C140	1	DD15150300	Ceramic 15pF ±5%
C141	1	DK16102300	Ceramic 0.001μF ±10%
C142	1	DK16102300	Ceramic 0.001μF ±10%
C143	1	DK18103030	Ceramic 0.01μF
C144	1	DK16102300	Ceramic 0.001μF ±10%
C145	1	DK16602300	Ceramic 0.001μF ±10%
C146	1	DK18103030	Ceramic 0.01μF

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
C147	1	DK18102300	Ceramic 0.001μF ±10%
C148	1	EJ10601610	Elect 10μF 16V
C149	1	DK16102300	Ceramic 0.001μF ±10%
C150	1	DK18103030	Ceramic 0.01μF
C151	1	EJ10601610	Elect 10μF 16V
C152	1	DK18103030	Ceramic 0.01μF
C153	1	DK18103030	Ceramic 0.01μF
C154	1	DS17223010	Ceramic 0.022μF
C155	1	DD15470300	Ceramic 47pF
C156	1	DK16101300	Ceramic 100pF ±10%
C201	1	DK16102300	Ceramic 0.001μF ±10%
C202	1	EJ22505010	Elect 2.2μF 50V
C203	1	EV10403560	Elect 0.1μF 35V
C204	1	DD15300370	Ceramic 30pF ±5%
C205	1	DK18103030	Ceramic 0.01μF
C206	1	DD15151370	Ceramic 15pF ±5%
C207	1	DS17473010	Semicon 0.047μF ±20%
C208	1	DK16471300	Ceramic 470pF ±10%
C209	1	EJ22505010	Elect 2.2μF 50V
C210	1	DK16471300	Ceramic 470pF ±10%
C211	1	DS17103010	Semicon 0.01μF ±20%
C212	1	EV22403560	Elect 0.22μF 35V
C213	1	DF17823300	Film 0.082μF ±20%
C214	1	DK16391300	Ceramic 390pF ±10%
C215	1	DK18103030	Ceramic 0.01μF
C216	1	DS17472010	Semicon 4700pF ±20%
C217	1	DK16102300	Ceramic 0.001μF ±10%
C218	1	DK16102300	Ceramic 0.001μF ±10%
C301	1	DK18103030	Ceramic 0.01μF
C302	1	DK18103030	Ceramic 0.01μF
C303	1	DD15470360	Ceramic 47pF ±5%
C304	1	DD15470360	Ceramic 47pF ±5%
C305	1	DK16102300	Ceramic 0.001μF ±10%

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
C306	1	DD15101050	Ceramic 100pF ±5%
C307	1	DD15101050	Ceramic 100pF ±5%
C308	1	DK18103030	Ceramic 0.01μF
C310	1	DD15220300	Ceramic 22pF ±5%
C311	1	DK18103030	Ceramic 0.01μF
C312	1	DK18103030	Ceramic 0.01μF
C313	1	DD10010300	Ceramic 1pF ±0.25pF
C315	1	DD15470360	Ceramic 47pF ±5%
C316	1	DD15470360	Ceramic 47pF ±5%
C317	1	DK16102300	Ceramic 0.001μF ±10%
C318	1	DD15101050	Ceramic 100pF ±5%
C319	1	DD15101050	Ceramic 100pF ±5%
C320	1	DD15220300	Ceramic 22pF ±5%
C321	1	DK18103300	Ceramic 0.01μF
C322	1	CT11000020	Trimming 10pF
C401	1	DK16102300	Ceramic 0.001μF ±10%
C402	1	DK16102300	Ceramic 0.001μF ±10%
C403	1	DK16102300	Ceramic 0.001μF ±10%
C404	1	DK16102300	Ceramic 0.001μF ±10%
C405	1	DK18103030	Ceramic 0.01μF
C406	1	DK18103030	Ceramic 0.01μF
C407	1	EV22403560	Elect 0.22μF 35V
C408	1	DK16102300	Ceramic 0.001μF ±10%
C409	1	DK18103030	Ceramic 0.01μF
			P101-RESISTORS
			(All Resistors are ±5% and ¼W)
RL01	1	GD05272140	2.7KΩ
RL02	1	RA01020330	10KΩ(B) Trimming
RL03	1	GD05152140	1.5KΩ
RL04	1	GD05822140	8.2KΩ
RL05	1	GD05103140	10KΩ

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
RL06	1	GD05103140	10KΩ
RL07	1	GD05103140	10KΩ
RL08	1	GD05103140	10KΩ
RL09	1	GD05333140	33KΩ
RL10	1	GD05333140	33KΩ
RL11	1	GD05334140	330KΩ
RL12	1	GD05394140	390KΩ
RL13	1	GD05183140	18KΩ
RL15	1	GD05155140	1.5MΩ
RL16	1	GD05273140	27KΩ
RL17	1	GD05563140	56KΩ
RL18	1	GD05274140	270KΩ
RL19	1	GD05102140	1KΩ
RL20	1	GD05104140	100KΩ
RL21	1	GD05392140	3.9KΩ
RL22	1	GD05223140	22KΩ
RL23	1	GD05103140	10KΩ
RS02	1	GD05183140	18KΩ
RS03	1	GD05103140	10KΩ
RS04	1	GD05332140	3.3KΩ
RS05	1	GD05102140	1KΩ
RS07	1	GD05104140	100KΩ
RS08	1	GD05272140	2.7KΩ
R101	1	GD05822140	1.2KΩ -03
R102	1	GD05103140	10KΩ
R103	1	GD05681140	680Ω
R104	1	GD05222140	2.2KΩ
R106	1	GD05824140	820KΩ
R107	1	GD05182140	1.8KΩ
R108	1	GD05474140	470KΩ
R109	1	GD05222140	2.2KΩ
R110	1	GD05101140	100Ω

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
R111	1	GD05101140	100Ω
R112	1	GD05474140	470KΩ
R113	1	GD05332140	3.3KΩ
R114	1	GD05224140	220KΩ
R115	1	GD05392140	3.9KΩ
R116	1	GD05223140	22KΩ
R117	1	GD05822140	8.2KΩ
R118	1	RC00000140	0Ω
R127	1	GD05222180	2.2KΩ 1/8W
R130	1	GD05104140	100KΩ
R131	1	GD05223140	22KΩ
R132	1	GD05223140	22KΩ
R133	1	GD05221140	220Ω
R134	1	GD05333140	33KΩ
R135	1	GD05472140	4.7KΩ
R136	1	GD05221140	220Ω
R137	1	GD05222140	2.2KΩ
R138	1	GD05561140	560Ω
R139	1	GD05103140	10KΩ
R140	1	GD05101140	100Ω
R201	1	RA01020330	1KΩ(B) Trimming
R202	1	GD05102140	1KΩ
R203	1	GD05472140	4.7KΩ
R204	1	GD05472140	4.7KΩ
R205	1	GD05334140	330KΩ
R206	1	GD05473140	47KΩ
R207	1	GD05472140	4.7KΩ
R208	1	GD05104140	100KΩ
R209	1	GD05223140	22KΩ
R210	1	GD05105140	1MΩ
R211	1	GD05123140	12KΩ
R212	1	GD05123140	12KΩ
R213	1	GD05822140	8.2KΩ

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
R214	1	GD05333140	33KΩ
R215	1	GD05822140	8.2KΩ
R217	1	RA01030490	10KΩ(B) Trimming
R218	1	GD05102140	1KΩ
R219	1	GD05472140	4.7KΩ
R220	1	GD05472140	4.7KΩ
R221	1	GD05473140	47KΩ
R301	1	GD05473140	47KΩ
R302	1	GD05473140	47KΩ
R303	1	GD05473140	47KΩ
R304	1	GD05562140	5.6KΩ
R305	1	GD05562140	5.6KΩ
R306	1	GD05331140	330Ω
R307	1	GD05223140	22KΩ
R308	1	GD05472140	4.7KΩ
R309	1	GD05102140	1KΩ
R310	1	GD05102140	1KΩ
R311	1	GD05101140	100Ω
R312	1	RC00000120	0Ω ½W
R313	1	GD05473180	47KΩ 1/8W
R314	1	GD05473180	47KΩ 1/8W
R315	1	GD05473180	47KΩ 1/8W
R316	1	RC00000120	0Ω ½W
R317	1	GD05562180	5.6KΩ 1/8W
R318	1	GD05562180	5.6KΩ 1/8W
R319	1	GD05331180	330Ω 1/8W
R320	1	GD05102180	1KΩ 1/8W
R321	1	GD05102180	1KΩ 1/8W
R322	1	GD05222180	2.2KΩ 1/8W
R323	1	GD05222180	2.2KΩ 1/8W
R324	1	GD05333180	33KΩ 1/8W
R325	1	GD05103180	10KΩ 1/8W

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
R326	1	GD05333180	33KΩ 1/8W
R327	1	GD05103180	10KΩ 1/8W
R401	1	GD05222140	2.2KΩ
R328	1	GD05101180	100Ω 1/8W
R402	1	RA04720120	4.7KΩ(B) Trimming
R403	1	GD05222140	2.2KΩ
R404	1	RA04720120	4.7KΩ(B) Trimming
R405	1	GD05222140	2.2KΩ
R406	1	RA04720120	4.7KΩ(B) Trimming
R407	1	GD05103140	10KΩ
R408	1	GD05104140	100KΩ
R409	1	GD05682140	6.8KΩ
R410	1	GD05103140	10KΩ
R411	1	GD05682140	6.8KΩ
R412	1	RA04720120	4.7KΩ(B) Trimming
R413	1	GD05103140	10KΩ
R414	1	GD05103140	10KΩ
R416	1	GD05223140	22KΩ
R417	1	GD05103140	10KΩ
R418	1	GD05104140	100KΩ
R451	1	GD05334140	330KΩ
R452	1	GD05474140	470KΩ
R453	1	GD05394140	390KΩ
R454	1	GD05103140	10KΩ
R455	1	GD05104140	100KΩ
R456	1	GD05104140	100KΩ
R457	1	GD05104140	100KΩ
R461	1	GD05334140	330KΩ
R462	1	GD05474140	470KΩ
R463	1	GD05394140	390KΩ
R464	1	GD05103140	10KΩ

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
R465	1	GD05104140	100KΩ
R466	1	GD05104140	100KΩ
R467	1	GD05104140	100KΩ
R471	1	GD05474140	470KΩ
R480	1	GD05223140	22KΩ
R481	1	RA02230090	22KΩ(B) Trimming
R482	1	GD05223140	22KΩ
R483	1	RA02230090	22KΩ(B) Trimming
R484	1	GD05333180	33KΩ 1/8W
R485	1	GD05103180	10KΩ 1/8W
R486	1	GD05333180	33KΩ 1/8W
R487	1	GD05103180	10KΩ 1/8W
			P101-SEMICONDUCTORS
QL01	1	HC10018370	IC MP5356
QL02	1	HC10010370	IC TMS1024C
QL03	1	HC10014170	IC MC14011BCP
QL04	1	HC10012170	IC MC14016CP
QL05	1	HT107331P0	Transistor 2SA733(P)
QL06	1	HD20011050	Diode 1S1555
QL07	1	HD20011050	Diode 1S1555
QL08	1	HD20011050	Diode 1S1555
QL09	1	HD20011050	Diode 1S1555
QL10	1	HD20011050	Diode 1S1555
QL11	1	HD20011050	Diode 1S1555
QL12	1	HD20011050	Diode 1S1555
QL13	1	HD20011050	Diode 1S1555
QL14	1	HD20011050	Diode 1S1555
QL15	1	HD20011050	Diode 1S1555
QL16	1	HD20011050	Diode 1S1555
QL18	1	HD20011050	Diode 1S1555
QL20	1	HD20011050	Diode 1S1555
QS01	1	HT313681B0	Transistor 2SC1368(B)

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
QS02	1	HD30060090	Zener XZ094
QS03	1	HT313681B0	Transistor 2SC1368(B)
QS04	1	HT309451Q0	Transistor 2SC945(Q)
QS05	1	HD20011050	Diode 1S1555
QS06	1	HT107381B0	Transistor 2SA738(B)
QS07	1	HT313681B0	Transistor 2SC1368(B)
QS08	1	HD30060090	Zener XZ094
QS09	1	HC10031060	IC μPC78L05
QS10	1	HC10022060	IC μPC78L08
QS11	1	HT312131B0	Transistor 2SC1213(B)
QS12	1	HD30078090	Zener XZ076
QS13	1	HT309451Q0	Transistor 2SC945(Q)
QS14	1	HD10005020	Diode OA99
QS16	1	HD10005020	Diode OA-99
QS17	1	HF200301B0	F.E.T. 2SK30(O)
QS18	1	HD20011050	Diode 1S1555
QS19	1	HF202461B0	F.E.T. 2SK246(Y)
Q101	1	HC10011170	IC MC1415106P
Q102	1	HT305351B0	Transistor 2SC535(B)
Q103	1	HT305351B0	Transistor 2SC535(B)
Q104	1	HT304601B0	Transistor 2SC460(B)
Q105	1	HT304601B0	Transistor 2SC460(B)
Q106	1	HC707300A0	IC 74LS73
Q120	1	HF401011B0	F.E.T. 3SK101(GR)
Q121	1	HT323471O0	Transistor 2SC2347
Q122	1	HD20010060	Diode 1SS53
Q123	1	HD20010060	Diode 1SS53
Q124	1	HT309451Q0	Transistor 2SC945(Q)
Q201	1	HC10003090	IC NJM4558D
Q202	1	HC10003090	IC NJM4558D
Q301	1	HD40001060	Varicap 1SV50
Q302	1	HD40002060	Varicap 1S2208
Q303	1	HT304601B0	Transistor 2SC460B
Q304	1	HT323471O0	Transistor 2SC2347

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
Q305	1	HD40001060	Varicap 1SV50
Q306	1	HD40001060	Varicap 1SV50
Q307	1	HT304601B0	Transistor 2SC460B
Q308	1	HT106082A0	Transistor 2SA608
Q309	1	HT106082A0	Transistor 2SA608
Q310	1	HT305360F0	Transistor 2SC536F
Q311	1	HT305360F0	Transistor 2SC536F
Q401	1	HF202461C0	F.E.T. 2SK246(GR)
Q402	1	HD20011050	Diode 1S1555
Q403	1	HD20011050	Diode 1S1555
Q404	1	HD20011050	Diode 1S1555
Q405	1	HD20011050	Diode 1S1555
Q406	1	HD20011050	Diode 1S1555
Q407	1	HD20011050	Diode 1S1555
Q408	1	HD20011050	Diode 1S1555
Q409	1	HT309451Q0	Transistor 2SC945(Q)
Q410	1	HD20011050	Diode 1S1555
Q411	1	HT309451Q0	Transistor 2SC945(Q)
Q412	1	HT309451Q0	Transistor 2SC945(Q)
Q413	1	HT305360F0	Transistor 2SC536F
Q414	1	HT305360F0	Transistor 2SC536F
			P101-MISCELLANEOUS
JL01	1	YJ07000420	Jack (2P)
JL02	1	YJ07000430	Jack (3P)
JL03	1	YJ07000440	Jack (4P)
JL04	1	YJ07000460	Jack (6P)
JL05	1	YJ07000450	Jack (5P)
JL06	1	YJ07000460	Jack (6P)
JL07	1	YJ07000430	Jack (3P)
JL08	1	YP10002210	Plug (1P)
JL09	1	YP10002210	Plug (1P)
JL10	1	YP10002210	Plug (1P)

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
JS01	1	YJ07000510	Jack (11P)
JS02	1	YJ07000510	Jack (11P)
J101	1	YJ07000440	Jack (4P)
J102	1	YJ07000430	Jack (3P)
J103	1	YJ07000430	Jack (3P)
J104	1	YJ07000440	Jack (4P)
J105	1	YJ07000420	Jack (2P)
J106	1	YP10002210	Plug, Test Point
L101	1	LC13940010	Choke Coil, 390μH
L102	1	LA70280090	Ant. Coil
L103	1	LC11030020	Choke Coil, 10μH
L104	1	LC12720020	Choke Coil, 2.7μH
L105	1	LC11050040	Choke Coil, 1mH
L120	1	LA70280150	Ant. Coil
L121	1	LA70280160	Ant. Coil
L122	1	LC11030060	Choke Coil, 10μH
L123	1	LC11030060	Choke Coil, 10μH
L201	1	LC11220030	Choke Coil, 1.2μH
L301	1	LA70360010	Ant. Coil
L302	1	LA70280090	Ant. Coil
L303	1	LA70280090	Ant. Coil
L310	1	LA70360010	Ant. Coil
SL01	1	SS01020340	Slide Switch
X101	1	XY41024002	Crystal 10.24MHz
X102	1	XC111001X1	Crystal 21.697500MHz
X103	1	XC111003X1	Crystal 22.0308MHz VXO
			P120-VCO CIRCUIT BOARD
P120	1	YF203C0010	P.W. Board, VCO

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
			P120-CAPACITORS
C120	1	DC18202020	Feedthru 2000pF
C121	1	DC18202020	Feedthru 2000pF
C122	1	DC18202020	Feedthru 2000pF
C123	1	DD10050300	Ceramic 5pF ±0.25pF
C124	1	DD15240300	Ceramic 24pF ±5%
C125	1	DD10010300	Ceramic 1pF ±0.25pF
C126	1	DD15200300	Ceramic 20pF ±5%
C127	1	CT10600090	Trimming 6pF
C128	1	DD11060300	Ceramic 6pF ±0.5pF
C129	1	DD15200300	Ceramic 20pF ±5%
C130	1	DD11100300	Ceramic 10pF ±0.5%
C131	1	DD11100300	Ceramic 10pF ±0.5%
C132	1	EJ10601610	Elect 10pF 16V
C133	1	DD11070300	Ceramic 7pF ±0.5%
C134	1	DK16102300	Ceramic 0.001μF ±10%
C135	1	EJ47601010	Elect 47μF 10V
			P120-RESISTORS
			(All Resistors are ±5% and ¼W)
R120	1	GD05103140	10KΩ
R121	1	GD05104140	100KΩ
R122	1	GD05101140	100Ω
R123	1	GD05473140	47KΩ
R124	1	GD05104140	100KΩ
R125	1	GD05102140	1KΩ
R126	1	GD05101140	100Ω
			P120-SEMICONDUCTORS
Q110	1	HD40001060	Varicap 1SV50
Q111	1	HD40001060	Varicap 1SV50
Q112	1	HF200191B0	F.E.T. 2SK19(GR)
Q113	1	HT319591A0	Transistor 2SC1959(O)

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
			P120-COIL
L110	1	LC11220030	Choke Coil, 1.2μH
L111	1	LA70350020	Ant. Coil, 2.5T
L112	1	LC12720080	Choke Coil, 2.7μH
			P801-FUNCTION SWITCH CIRCUIT BOARD
P801	1	WH208C2630	P.W. Board, Function Switch
C804	1	EA47601030	Elect Cap. 47μF 10V
C818	1	DD15220370	Ceramic Cap. 22pF ±5%
C819	1	DD15220370	Ceramic Cap. 22pF ±5%
C820	1	DK18103030	Ceramic Cap. 0.01μF
C821	1	DK10103030	Ceramic Cap. 0.001μF -03
Q804	1	HD20011050	Diode 1S1555
S803	1	SS04030140	Slide Switch, VFO
S804	1	SS04030140	Slide Switch, MODE
			P802-EXT POWER SWITCH CIRCUIT BOARD
P802	1	WH208C2640	P.W. Board, EXT Power Switch
C805	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C806	1	DK16102300	Ceramic Cap. 0.001μF ±10%
Q806	1	HD20001100	Diode 10D-2
J802	1	YJ01001390	Jack, EXT Power
			P803-REAR SWITCH CIRCUIT BOARD
P803	1	WH208C1320	P.W. Board, Rear Switch

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
C810	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C811	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C812	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C813	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C814	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C815	1	DK16102300	Ceramic Cap. 0.001μF ±10%
C816	1	DK16102300	Ceramic Cap. 0.001μF ±10%
CZ02	1	EV22403560	Elect Cap. 0.22μF 35V
R803	1	RA01040290	Trimming Resistor 100kΩ(B)
S805	1	SK02010010	Keyboard Switch, Reset
S806	1	SS04030150	Slide Switch
			P804-LCD CIRCUIT BOARD
P804	1	YF200C0030	P.W. Board, LCD
Q801	1	HC10006370	IC TP0401, LCD Driver
Q810	1	HQ20401440	Display Unit
J807	1	YJ90000280	Jack, Connector
J808	1	YJ90000280	Jack, Connector
			PB01-BOOSTOR CIRCUIT BOARD
PB01	1	WH208C2620	P.W. Board, Boostor
			PB01-CAPACITORS
CB01	1	DK16102300	Ceramic 0.001μF ±10%
CB02	1	DD11100300	Ceramic 10pF ±0.5pF
CB03	1	DK16102300	Ceramic 0.001μF ±10%
CB04	1	DK18103310	Ceramic 0.01μF
CB05	1	DK18103310	Ceramic 0.01μF

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
CB06	1	CT11000020	Trimming 10pF
CB07	1	DD10050300	Ceramic 5pF ±0.25pF
CB08	1	DK18102030	Ceramic 0.001μF
CB09	1	DK18103310	Ceramic 0.01μF
CB10	1	DK18103310	Ceramic 0.01μF
CB11	1	CT11000020	Trimming 10pF
CB12	1	DD15220300	Ceramic 22pF ±5%
CB13	1	DD15300300	Ceramic 30pF ±5%
CB14	1	EA10601630	Elect 10μF 16V
CB15	1	DK16102300	Ceramic 0.001μF ±10%
CB16	1	DK16102300	Ceramic 0.001μF ±10%
CB17	1	DK18103310	Ceramic 0.01μF
CB18	1	DK16102300	Ceramic 0.001μF ±10%
CB19	1	CT11000020	Trimming 10pF
CB20	1	DD15240300	Ceramic 24pF ±5%
CB21	1	DD15470300	Ceramic 47pF ±5%
CB22	1	EA10601630	Elect 10μF 16V
CB23	1	DK16102300	Ceramic 0.001μF ±10%
CB24	1	DK16102300	Ceramic 0.001μF ±10%
CB25	1	DK18102030	Ceramic 0.001μF
CB26	1	DK18103310	Ceramic 0.01μF
CB27	1	DK16102300	Ceramic 0.001μF ±10%
CB28	1	DD15150300	Ceramic 15pF ±5%
CB29	1	CT11000020	Trimming 10pF
CB30	1	CT11000020	Trimming 10pF
CB31	1	DD11100300	Ceramic 10pF ±0.5pF
CB32	1	DD10010300	Ceramic 1pF ±0.25pF
CB33	1	DD15200300	Ceramic 20pF ±5%
CB34	1	DD15200300	Ceramic 20pF ±5%
CB35	1	DK16102300	Ceramic 0.001μF ±10%
CB36	1	DK16102300	Ceramic 0.001μF ±10%
CB37	1	DK16102300	Ceramic 0.001μF ±10%

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
CB38	1	EA22601630	Elect 22μF 16V
CB39	1	DK16102300	Ceramic 0.001μF ±10%
CB40	1	DK16102300	Ceramic 0.001μF ±10%
CB41	1	EA22602530	Elect 22μF 25V
CB42	1	DK18103030	Ceramic 0.01μF
CB43	1	DK18103310	Ceramic 0.01μF
CB44	1	DD16005370	Ceramic 0.5pF
			PB01-RESISTORS
			(All Resistors are ±5% and ¼W)
RB01	1	GD05470140	47Ω
RB02	1	GD05471140	470Ω
RB03	1	GD05104140	100KΩ
RB04	1	GD05153140	15KΩ
RB05	1	GD05563140	56KΩ
RB06	1	GD05563140	56KΩ
RB07	1	GD05101140	100Ω
RB08	1	GD05331140	330Ω
RB09	1	GD05102140	1KΩ
RB10	1	GD05221140	220Ω
RB11	1	GD05470140	47Ω
RB12	1	GD05681140	680Ω
RB13	1	GD05182140	1.8KΩ
RB14	1	GD05100140	10Ω
RB15	1	GD05221140	220Ω
RB16	1	RA01020330	1KΩ(B) Trimming
RB17	1	GD05221140	220Ω
RB18	1	GD05100140	100Ω
RB19	1	GD05391140	390Ω
RB20	1	RA04720120	4.7KΩ(B) Trimming
			PB01-SEMICONDUCTORS
QB01	1	HF401011B0	F.E.T. 3SK101(GR)
QB02	1	HT32053O0	Transistor 2SC2053
QB03	1	HT31970IO0	Transistor 2SC1970

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
QB04	1	HD20011050	Diode 1S1555
QB05	1	HT31971IO0	Transistor 2SC1971
QB06	1	HD20011050	Diode 1S1555
QB07	1	HD10004020	Diode OA91
QB08	1	HD10004020	Diode OA91
QB09	1	HT309451Q0	Transistor 2SC945(Q)
QB10	1	HD20011050	Diode 1S1555
			PB01-MISCELLANEOUS
FB01	1	FC90050010	Ferrite Core
FB02	1	FC90050010	Ferrite Core
JB01	1	YJ07000620	Jack (2P)
JB06	1	YP10002210	Plug
JB07	1	YP10002210	Plug
LB01	1	LA70280170	Ant. Coil
LB02	1	LC12010012	Choke Coil, 8T
LB03	1	LC16000010	Choke Coil, 5T
LB04	1	LC15000110	Choke Coil, 2T
LB05	1	LM12030010	Twist Coil, 12T
LB06	1	LC12010012	Choke Coil, 8T
LB07	1	LC12010012	Choke Coil, 8T
LB08	1	LM12030010	Twist Coil, 12T
LB09	1	LC12010012	Choke Coil, 8T
LB10	1	LC12010012	Choke Coil, 8T
LB11	1	LM12030010	Twist Coil, 12T
LB12	1	LC12010012	Choke Coil, 8T
LB13	1	LC16000010	Choke Coil, 5T
LB14	1	LC16000010	Choke Coil, 5T
LB15	1	LC11030020	Choke Coil, 10μH
LB16	1	LC12010012	Choke Coil, 8T
LB17	1	LA70280170	Ant. Coil

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
			PR01- RX-TX CIRCUIT BOARD
PR01	1	WH208C2610	P.W. Board, RX-TX
			PR01-CAPACITORS
CF01	1	CT11100120	Trimming 10pF
CF02	1	DK16102300	Ceramic 0.001μF ±10%
CF03	1	DD15300300	Ceramic 30pF ±5%
CF04	1	DD15101370	Ceramic 100pF ±5%
CF05	1	DD15330300	Ceramic 33pF ±5%
CF06	1	DD15330300	Ceramic 33pF ±5%
CF07	1	DD15220300	Ceramic 22pF ±5%
CF08	1	DD15330300	Ceramic 33pF ±5%
CF10	1	DK16102300	Ceramic 0.001μF ±10%
CF11	1	EA47502530	Ceramic 4.7μF 25V
CF12	1	DK18103030	Ceramic 0.01μF
CF13	1	DD15150300	Ceramic 15pF ±5%
CF14	1	DK18103030	Ceramic 0.01μF
CN01	1	DD10010300	Ceramic 1pF ±0.25pF
CN05	1	DS17223010	Semicon 0.022μF ±20%
CN06	1	DK18103030	Ceramic 0.01μF
CN07	1	DD15101350	Ceramic 100pF ±5%
CN08	1	DS17223010	Semicon 0.022μF ±20%
CN09	1	DK18103030	Ceramic 0.01μF
CN10	1	DD15470300	Ceramic 47pF ±5%
CN11	1	DK16102300	Ceramic 0.001μF ±10%
CN12	1	DK16102300	Ceramic 0.001μF ±10%
CN13	1	DK18103010	Ceramic 0.01μF
CN15	1	EA22601630	Elect 22μF 16V
CN16	1	EV10601060	Elect 10μF 10V
CN18	1	DS17103010	Semicon 0.01μF ±20%

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
CN19	1	DS17103010	Semicon 0.01μF ±20%
CN20	1	DS17103010	Semicon 0.01μF ±20%
CN21	1	DK16471300	Ceramic 470pF ±10%
CN22	1	EJ47502510	Elect 4.7μF 25V
CN23	1	DS17332010	Semicon 0.0033μF ±20%
CN24	1	EJ10505010	Elect 1μF 50V
CN25	1	EA10701030	Elect 100μF 10V
CN26	1	EA10602530	Elect 10μF 25V
CR01	1	DD15200300	Ceramic 20pF ±5%
CR02	1	DK16102300	Ceramic 0.001μF ±10%
CR03	1	DK18103030	Ceramic 0.01μF
CR04	1	DK16102300	Ceramic 0.001μF ±10%
CR05	1	DK16102300	Ceramic 0.001μF ±10%
CR06	1	DK16102300	Ceramic 0.001μF ±10%
CR07	1	DD15200300	Ceramic 20pF ±5%
CR08	1	DD10050300	Ceramic 5pF ±0.25pF
CR09	1	DK16102300	Ceramic 0.001μF ±10%
CR10	1	DK16102300	Ceramic 0.001μF ±10%
CR11	1	DD10020300	Ceramic 2pF ±0.25pF
CR12	1	DK18103030	Ceramic 0.01μF
CR13	1	DK18103030	Ceramic 0.01μF
CR14	1	DK16102300	Ceramic 0.001μF ±10%
CR15	1	DS17103010	Semicon 0.01μF ±20%
CR16	1	DK18103030	Ceramic 0.01μF
CR17	1	DK16471300	Ceramic 470pF ±10%
CR18	1	DK16102300	Ceramic 0.001μF ±10%
CR19	1	DK18103030	Ceramic 0.01μF
CR20	1	DK18103030	Ceramic 0.01μF
CR21	1	DD15120300	Ceramic 12pF ±5%
CR22	1	DK18103030	Ceramic 0.01μF
CR23	1	DK16102300	Ceramic 0.001μF ±10%
CR24	1	DD11080300	Ceramic 8pF ±0.5pF

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
CR26	1	DS17333010	Semicon 0.033μF ±20%
CR27	1	DK18103030	Ceramic 0.01μF
CR28	1	DS17103010	Semicon 0.01μF ±20%
CR29	1	DD15101370	Ceramic 100pF ±5%
CR30	1	DK18103030	Ceramic 0.01μF
CR31	1	DK18103030	Ceramic 0.01μF
CR32	1	DS17223010	Semicon 0.022μF ±20%
CR33	1	DS17223010	Semicon 0.022μF ±20%
CR34	1	DK18103030	Ceramic 0.01μF
CR36	1	DD15101370	Ceramic 100pF ±5%
CR37	1	DK18103030	Ceramic 0.01μF
CR39	1	DS17223010	Semicon 0.022μF ±20%
CR40	1	DS17223010	Semicon 0.022μF ±20%
CR41	1	DS17103010	Semicon 0.01μF ±20%
CR42	1	DD15220300	Ceramic 22pF ±5%
CR43	1	DK18103030	Ceramic 0.01μF
CR44	1	DK18103030	Ceramic 0.01μF
CR45	1	EV22403560	Elect 0.22μF 35V
CR46	1	DK16101300	Ceramic 100pF ±10%
CR47	1	DS17223010	Semicon 0.022μF
CR48	1	EA47601630	Elect 47μF 16V
CR49	1	DK16102300	Ceramic 0.001μF ±10%
CR50	1	DD15151370	Ceramic 150pF ±5%
CR51	1	DD15360300	Ceramic 36pF ±5%
CR52	1	DD15560330	Ceramic 56pF ±5%
CR53	1	EV10502560	Elect 1μF 25V
CR54	1	EV10502560	Elect 1μF 25V
CR55	1	DS17473010	Semicon 0.047μF ±20%
CR56	1	DS17332010	Semicon 0.0033μF ±20%
CR57	1	DK16471300	Ceramic 470pF ±10%
CR58	1	EV10502560	Elect 1μF 25V
CR59	1	DS17223010	Semicon 0.022μF ±20%

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
CR60	1	EV10502560	Elect 1μF 25V
CR61	1	DD15120300	Ceramic 12pF ±5%
CR62	1	DD15430330	Ceramic 43pF ±5%
CR63	1	EA10701030	Elect 100μF 10V
CR64	1	DK18103030	Ceramic 0.01μF
CR65	1	DS17152010	Semicon 0.0015μF ±20%
CR66	1	DS17473010	Semicon 0.047μF ±20%
CR67	1	DS17473010	Semicon 0.047μF ±20%
CR68	1	EV10601060	Elect 10μF 10V
CR69	1	DK18103030	Ceramic 0.01μF
CR70	1	DS17223010	Semicon 0.022μF ±20%
CR71	1	EQ47502530	Elect 4.7μF 25V
CR72	1	DK18103030	Ceramic 0.01μF
CR73	1	DD15150300	Ceramic 15pF ±5%
CR74	1	DK18103030	Ceramic 0.01μF
CR75	1	EJ10405010	Elect. 0.1μF 50V
CR77	1	EV10403560	Elect 0.1μF 35V
CR78	1	DS17472010	Semicon 0.0047μF ±20%
CR79	1	DK18103030	Ceramic 0.01μF
CR80	1	EJ10601610	Elect 10μF 16V
CR81	1	EA47601630	Elect 47μF 16V
CR82	1	DK16101300	Ceramic 100pF ±10%
CR83	1	EA47601030	Elect 47μF 10V
CR84	1	EA10701630	Elect 100μF 16V
CR85	1	EV33601060	Elect 33μF 10V
CR86	1	EA10701030	Elect 100μF 10V
CR87	1	DF16104010	Film 0.1μF ±10%
CR88	1	DK18103030	Ceramic 0.01μF
CR89	1	DK18103030	Ceramic 0.01μF
CT01	1	CT12000090	Trimming 20pF
CT02	1	CT12000090	Trimming 20pF
CT03	1	CT12000090	Trimming 20pF

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
CT04	1	CT12000090	Trimming 20pF
CT05	1	DK18103030	Ceramic 0.01μF
CT06	1	DK18103030	Ceramic 0.01μF
CT07	1	DK18103030	Ceramic 0.01μF
CT08	1	DK18103030	Ceramic 0.01μF
CT09	1	DD15200300	Ceramic 10pF ±0.5pF
CT10	1	DD11100300	Ceramic 20pF ±5%
CT11	1	DK18103030	Ceramic 0.01μF
CT12	1	DD15510330	Ceramic 51pF ±5%
CT13	1	DD15510330	Ceramic 51pF ±5%
CT14	1	DK18103030	Ceramic 0.01μF
CT15	1	DK18103030	Ceramic 0.01μF
CT16	1	DD15470300	Ceramic 47pF ±5%
CT17	1	DD15470300	Ceramic 47pF ±5%
CT18	1	DK18103030	Ceramic 0.01μF
CT19	1	DK16102300	Ceramic 0.001μF ±10%
CT21	1	DD15510300	Ceramic 51pF ±5%
CT22	1	DK18103030	Ceramic 0.01μF
CT23	1	DD15220300	Ceramic 22pF ±5%
CT24	1	CT12000090	Trimming 20pF
CT25	1	DD15330300	Ceramic 33pF ±5%
CT26	1	DK18103030	Ceramic 0.01μF
CT27	1	DK18103030	Ceramic 0.01μF
CT28	1	DK16331300	Ceramic 330pF ±10%
CT29	1	DS17473010	Semicon 0.047μF ±20%
CT30	1	DK16101300	Ceramic 100pF ±10%
CT31	1	DS17103010	Semicon 0.01μF ±20%
CT32	1	EV10502560	Elect 1μF 25V
CT33	1	EV33501060	Elect 3.3μF 10V
CT34	1	EJ47502510	Elect 4.7μF 25V
CT35	1	DK18103030	Ceramic 0.01μF
CT36	1	DK18103030	Ceramic 0.01μF
CT37	1	DD15220300	Ceramic 22pF ±5%

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
CT38	1	DD15220300	Ceramic 22pF ±5%
CT39	1	DK18103030	Ceramic 0.01μF
CT40	1	DK18103030	Ceramic 0.01μF
CT41	1	DK18103030	Ceramic 0.01μF
CT56	1	DD10050300	Ceramic 5pF
CT42	1	DS17223010	Semicon 0.022μF ±20%
CT55	1	DK18103030	Ceramic 0.01μF
CT44	1	DK18103030	Ceramic 0.01μF
CT45	1	DK18103030	Ceramic 0.01μF
CT47	1	DK18103030	Ceramic 0.01μF
CT48	1	DS17103010	Semicon 0.01μF ±20%
CT49	1	DS17223030	0.022μF
CT50	1	DS17223030	0.022μF
CT51	1	DK18102030	Ceramic 0.001μF ±10%
CT52	1	DK16102300	Ceramic 0.001μF ±10%
CT53	1	DK16102300	Ceramic 0.001μF ±10%
CT54	1	DD10050300	Ceramic 5pF
			PR01-RESISTORS
			(All Resistors are ±5% and ¼W)
RF01	1	GD05272140	2.7KΩ
RF14	1	RA04720120	4.7KΩ(B) Trimming
RN01	1	GD05221140	220Ω
RN02	1	GD05223140	22KΩ
RN03	1	GD05472180	4.7KΩ 1/8W
RN07	1	GD05102140	1KΩ
RN08	1	GD05822140	8.2KΩ
RN09	1	GD05331140	330Ω
RN10	1	GD05223140	22KΩ
RN11	1	GD05223140	22KΩ
RN12	1	GD05103140	10KΩ
RN13	1	GD05101140	100Ω
RN14	1	GD05333140	33KΩ

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
RN15	1	GD05273140	27KΩ
RN17	1	GD05223140	22KΩ
RN18	1	GD05103140	10KΩ
RN19	1	GD05332140	3.3KΩ
RN20	1	GD05822140	8.2KΩ
RN21	1	GD05822140	8.2KΩ
RN22	1	GD05474140	470KΩ
RN23	1	GD05222140	2.2KΩ
RN24	1	GD05822140	8.2KΩ
RN25	1	GD05472180	4.7KΩ 1/8W
RN26	1	RA02230090	22KΩ(B) Trimming
RN27	1	GD05472140	4.7KΩ
RR01	1	GD05104140	100KΩ
RR02	1	GD05223140	22KΩ
RR05	1	GD05470140	47Ω
RR06	1	GD05101140	100Ω
RR07	1	GD05101140	100Ω
RR08	1	GD05562140	5.6KΩ
RR09	1	GD05473140	47KΩ
RR10	1	GD05473140	47KΩ
RR11	1	GD05560140	56Ω
RR12	1	GD05101140	100Ω
RR13	1	GD05152140	1.5KΩ
RR14	1	GD05152140	1.5KΩ
RR15	1	GD05103180	10KΩ 1/8W
RR16	1	GD05393140	39KΩ
RR19	1	GD05151140	150Ω
RR20	1	GD05101140	100Ω
RR21	1	GD05472140	4.7KΩ
RR22	1	GD05103140	10KΩ
RR23	1	GD05103140	10KΩ
RR24	1	GD05333140	33KΩ

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
RR26	1	GD05681140	680Ω
RR28	1	GD05393140	39KΩ
RR29	1	GD05821140	820Ω
RR31	1	GD05101140	100Ω
RR32	1	GD05472140	4.7KΩ
RR33	1	GD05221140	220Ω
RR34	1	GD05562140	5.6KΩ
RR37	1	GD05222140	2.2KΩ
RR38	1	GD05221140	220Ω
RR39	1	GD05103140	10KΩ
RR40	1	GD05221140	220Ω
RR41	1	GD05103140	10KΩ
RR42	1	GD05471180	470Ω 1/8W
RR45	1	GD05101140	100Ω
RR46	1	GD05172140	47KΩ
RR47	1	GD05221140	220Ω
RR49	1	GD05471140	470Ω
RR50	1	GD05821140	820Ω
RR51	1	GD05471140	470Ω
RR52	1	GD05105140	1MΩ
RR53	1	RA02220160	2.2KΩ(B) Trimming
RR54	1	GD05222140	2.2KΩ
RR55	1	GD05332140	3.3KΩ
RR56	1	GD05332140	3.3KΩ
RR57	1	RA01020330	1KΩ(B) Trimming
RR58	1	RA04720120	4.7KΩ(B) Trimming
RR59	1	GD05103140	10KΩ
RR60	1	GD05224140	220KΩ
RR61	1	GD05392140	3.9KΩ
RR62	1	GD05332140	3.3KΩ
RR63	1	GD05333140	33KΩ
RR64	1	GD05222140	2.2KΩ
RR65	1	GD05222140	2.2KΩ

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
RR66	1	GD05473140	47KΩ
RR67	1	GD05123140	12KΩ
RR68	1	GD05273140	27KΩ
RR69	1	GD05333140	33KΩ
RR70	1	RA02220150	2.2KΩ(B) Trimming
RR71	1	GD05822140	8.2KΩ
RR72	1	GD05822140	8.2KΩ
RR73	1	GD05103140	10KΩ
RR74	1	GD05185140	1.8MΩ
RR75	1	GD05393140	39KΩ
RR76	1	GD05103140	10KΩ
RR77	1	GD05103140	10KΩ
RR78	1	GD05224140	220KΩ
RR79	1	GD05104140	100KΩ
RR80	1	GD05153140	15KΩ
RR81	1	GD05151140	150Ω
RR82	1	GD05332140	3.3KΩ
RR83	1	GD05104180	100KΩ 1/8W
RR84	1	GD05682180	6.8KΩ 1/8W
RR85	1	GD05102180	1KΩ 1/8W
RR86	1	RC00000120	0Ω
RT01	1	GD05104140	100KΩ
RT02	1	GD05104140	100KΩ
RT03	1	GD05104140	100KΩ
RT04	1	GD05104140	100KΩ
RT05	1	GD05392140	3.9KΩ
RT06	1	GD05333140	33KΩ
RT07	1	GD05153140	15KΩ
RT08	1	GD05473140	47KΩ
RT09	1	GD05562140	5.6KΩ
RT10	1	GD05183140	18KΩ
RT11	1	GD05102140	1KΩ
RT12	1	GD05472140	4.7KΩ

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
RT13	1	GD05332140	3.3KΩ
RT14	1	GD05154140	150KΩ
RT15	1	GD05330140	33Ω
RT16	1	GD05331140	330Ω
RT17	1	GD05221140	220Ω
RT18	1	RA01010100	100Ω(B) Trimming
RT19	1	GD05221140	220Ω
RT20	1	GD05103140	10KΩ
RT21	1	GD05101140	100Ω
RT22	1	GD05221140	220Ω
RT23	1	RA04720120	4.7KΩ(B) Trimming
RT24	1	GD05154140	150KΩ
RT25	1	GD05152140	1.5KΩ
RT26	1	GD05223140	22KΩ
RT27	1	GD05681140	680Ω
RT28	1	GD05102140	1KΩ
RT29	1	GD05331140	330Ω
RT30	1	GD05223140	22KΩ
RT48	1	GD05104140	100KΩ
RT31	1	GD05103140	10KΩ
RT32	1	GD05333140	33KΩ
RT33	1	GD05103180	10KΩ 1/8W
RT34	1	GD05103140	10KΩ
RT35	1	GD05103140	10KΩ
RT36	1	RA04710060	470Ω(B) Trimming
RT37	1	GD05332140	3.3KΩ
RT38	1	GD05101140	100Ω
RT39	1	GD05103140	10KΩ
RT40	1	GD05103140	10KΩ
RT41	1	GD05103140	10KΩ
RT42	1	GD05563140	56KΩ
RT44	1	GD05563140	56KΩ
RT45	1	GD05563140	56KΩ
RT46	1	GD05563140	56KΩ
RT47	1	GD05103140	10KΩ

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION	
			PR01-SEMICONDUCTORS	
QF30	1	HD20001200	Diode	MI301
QF31	1	HD20001200	Diode	MI301
QF32	1	HD20005060	Diode	1SS16
QF33	1	HD20011050	Diode	1S1555
QF34	1	HD20011050	Diode	1S1555
QN01	1	HD10004020	Diode	OA91
QN02	1	HF202411B0	F.E.T.	2SK241(Y)
QN03	1	HT304601B0	Transistor	2SC640(B)
QN05	1	HT309451Q0	Transistor	2SC945(Q)
QN06	1	HT309451Q0	Transistor	2SC945(Q)
QN07	1	HT107331Q0	Transistor	2SA733(Q)
QN08	1	HT309451Q0	Transistor	2SC945(Q)
QN09	1	HT309451Q0	Transistor	2SC945(Q)
QN10	1	HT309451Q0	Transistor	2SC945(Q)
QN11	1	HT107331Q0	Transistor	2SA733(Q)
QN30	1	HD10004020	Diode	OA91
QN31	1	HD10004020	Diode	OA91
QN32	1	HD20011050	Diode	1S1555
QR01	1	HF202411B0	F.E.T.	2SK241(Y)
QR02	1	HF401021B0	F.E.T.	3SK102(GR)
QR03	1	HF202411B0	F.E.T.	2SK241(Y)
QR04	1	HF202411B0	F.E.T.	2SK241(Y)
QR05	1	HF202411B0	F.E.T.	2SK241(Y)
QR06	1	HF401011B0	F.E.T.	3SK101(GR)
QR07	1	HT309001E0	Transistor	2SC900(E)
QR08	1	HC10015170	IC	MC3357P
QR09	1	HT309001E0	Transistor	2SC900(E)
QR10	1	HT309451Q0	Transistor	2SC945(Q)
QR11	1	HC10037060	IC	μPC575-C2
QR30	1	HD20011050	Diode	1S1555

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION	
QR31	1	HD20011050	Diode	1S1555
QR32	1	HD20013060	Diode	ND487R1-3R
QR33	1	HD10004020	Diode	OA91
QR34	1	HD10004020	Diode	OA91
QR35	1	HD10004020	Diode	OA91
QR36	1	HD20011050	Diode	1S1555
QR37	1	HD20011050	Diode	1S1555
QR38	1	HD20011050	Diode	1S1555
QR39	1	HD10004020	Diode	OA91
QR40	1	HD20011050	Diode	1S1555
QR41	1	HD20011050	Diode	1S1555
QR43	1	HD30033090	Zener	WZ-052
QR44	1	HD20011050	Diode	1S1555
QR45	1	HD20011050	Diode	1S1555
QR46	1	HD10004020	Diode	OA91
QR47	1	HD20011050	Diode	1S1555
QT01	1	HT309451Q0	Transistor	2SC945(Q)
QT02	1	HT304601B0	Transistor	2SC460(B)
QT03	1	HT304601B0	Transistor	2SC460(B)
QT04	1	HT304601B0	Transistor	2SC460(B)
QT05	1	HF200191B0	F.E.T.	2SK19(GR)
QT06	1	HT309001E0	Transistor	2SC900(E)
QT07	1	HT309001E0	Transistor	2SC900(E)
QT08	1	HF401011C0	F.E.T.	3SK101(BL)
QT09	1	HF401011C0	F.E.T.	3SK101(BL)
QT10	1	HT107331Q0	Transistor	2SA733(Q)
QT11	1	HT309451Q0	Transistor	2SC945(Q)
QT30	1	HD20011050	Diode	1S1555
QT31	1	HD20011050	Diode	1S1555
QT32	1	HD20011050	Diode	1S1555
QT33	1	HD20011050	Diode	1S1555

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
QT34	1	HD20013060	Diode ND487R1-3R
QT35	1	HD20011050	Diode 1S1555
QT36	1	HD10004020	Diode OA91
QT37	1	HD40010090	Diode 1S2688C
QT38	1	HD40010090	Diode 1S2688C
QT39	1	HD40010090	Diode 1S2688C
			PR01-MISCELLANEOUS
FR01	1	XU410700M5	Crystal 10.7MHz(M)
FR02	1	XV710700S3	Crystal 10.7MHz
FR03	1	FG455304F0	Ceramic Filter CFU-455F
FR04	1	FG455304F0	Ceramic Filter CFU-455F
JR01	1	YJ07000420	Jack (2P)
JR02	1	YJ07000430	Jack (3P)
JR03	1	YJ07000420	Jack (2P)
JR04	1	YP10002210	Plug
JR05	1	YJ07000440	Jack (4P)
JR06	1	YJ07000440	Jack (4P)
JR07	1	YP10002210	Plug
JT01	1	YJ07000430	Jack (3P)
JT02	1	YJ07000420	Jack (2P)
JT03	1	YJ07000450	Jack (5P)
JT04	1	YJ07000440	Jack (4P)
JT05	1	YJ07000420	Jack (2P)
JT06	1	YJ07000440	Jack (4P)
JT07	1	YJ07000440	Jack (4P)
JT08	1	YJ07000360	Jack
JT10	1	YP10002210	Plug
LF01	1	LL050003A5	Coil, 3T
LF02	1	LC11010080	Choke Coil, 4T
LF03	1	LC18000160	Choke Coil, 3T
LF04	1	LC18000160	Choke Coil, 3T
LF05	1	LL635004A0	Coil, 4T

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
LF06	1	LL635004A0	Coil, 4T
LF07	1	LL653004A3	Coil, 3T
LN01	1	LI71016100	I.F.T. Coil
LN02	1	LI71016100	I.F.T. Coil
LN03	1	LI71016100	I.F.T. Coil
LR01	1	LA70260040	Ant. Coil
LR02	1	LA15040010	Ant. Coil
LR03	1	LI71016100	I.F.T. Coil
LR04	1	LI71016100	I.F.T. Coil
LR05	1	LI71016120	I.F.T. Coil
LR06	1	LI71016150	I.F.T. Coil
LR07	1	LI71016150	I.F.T. Coil
LR08	1	LI71016160	I.F.T. Coil
LR09	1	LI71016090	I.F.T. Coil
LR30	1	LC11050040	Choke Coil, 1mH
LR31	1	LC11030060	Choke Coil, 10μH
LR32	1	LC11040010	Choke Coil, 100μH
LR33	1	LC11030060	Choke Coil, 10μH
LR34	1	LC11050040	Choke Coil, 1mH
LR35	1	LA55016080	Ant. Coil
LT01	1	LA70360020	Ant. Coil
LT02	1	LI71016120	I.F.T. Coil
LT03	1	LI71016120	I.F.T. Coil
LT04	1	LA70280170	Ant. Coil
LT05	1	LA70270030	Ant. Coil
LT06	1	LA55016080	Ant. Coil
LT30	1	LC13940010	Choke Coil, 390μH
LT31	1	LC13940010	Choke Coil, 390μH
LT32	1	LC13940010	Choke Coil, 390μH
LT33	1	LC13940010	Choke Coil, 390μH
LT34	1	LC13940010	Choke Coil, 390μH

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
LT35	1	LC11030060	Choke Coil, 10μH
LT36	1	LC11030060	Choke Coil, 10μH
LT37	1	LC11050040	Choke Coil, 1mH
LT38	1	LC11050040	Choke Coil, 1mH
XR01	1	XA21024504	Crystal 10.245MHz
XT01	1	XB111001G1	Crystal 10.7MHz
			P001-TONE BURST CIRCUIT BOARD
P001	1	YF208C0020	P.W. Board, Tone Burst
			P001-CAPACITORS
C001	1	DK26103020	Ceramic 0.01μF 50V
C002	1	DK26104010	Ceramic 0.1μF 50V
C003	1	EV33501660	Elect 3.3μF 16V
C004	1	DK26333010	Ceramic 0.033μF 50V
C005	1	DK16471300	Ceramic 470pF
C006	1	DK26473010	Ceramic 0.047μF 50V
C007	1	DK16102300	Ceramic 0.001μF
C008	1	DK16102300	Ceramic 0.001μF
C009	1	EV47501660	Elect 4.7μF 16V
			P001-SEMICONDUCTORS
Q001	1	HT305360F0	Transistor 2SC536(F)
Q002	1	HD20011050	Diode 1S1555
Q003	1	HC10019170	IC MC14093BCP
Q004	1	HD20011050	Diode 1S1555
Q005	1	HT305360F0	Transistor 2SC536(F)
Q006	1	HT305360F0	Transistor 2SC536(F)
Q007	1	HD30029090	Diode WZ-090

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
			P001-RESISTORS
R001	1	GD05103180	10KΩ 1/8W
R002	1	GD05104180	100KΩ 1/8W
R003	1	GD05105180	1MΩ 1/8W
R004	1	GD05224180	220KΩ 1/8W
R005	1	RA01030520	Trimming 10KΩ
R006	1	GD05824180	820KΩ 1/8W
R007	1	RA04730100	Trimming 47KΩ
R008	1	GD05393180	39KΩ 1/8W
R009	1	GD05682180	6.8KΩ 1/8W
R010	1	RA01030530	Trimming 10KΩ
R011	1	GD05683180	68KΩ 1/8W
R012	1	GD05224180	220KΩ 1/8W
R013	1	GD05103180	10KΩ 1/8W

No. 016-01, E01-81,5

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

SPECIFICATIONS

1. General Specifications

Frequency	144.0000 ~ 147.999 MHz
Type of emission	FM (F_3), SSB (A_3J), CW (A_1)
Frequency stability (room temperature)	±300 Hz within 1 ~ 60 minutes after power on 50 Hz every 30 minutes
Power supply	External: 13.8 VDC Internal: 1. UN-3 Ni-Cad battery x 10 2. UM-3 dry cell x 9
Operating supply voltage range	9.6 ~ 16 VDC
Power consumption	FM reception standby: 90 mA Non-signal SSB and CW: 90 mA Transmission: 600 mA (at 1 W into 50 Ω load) Memory back up: 40 μA
Microphone input impedance	600 Ω
Antenna impedance	50 Ω
AF output impedance	8 Ω
Grounding system	Negative
Dimensions	129 (W) x 52 (H) x 190.5 (D) mm
Weight	1.25 kg (1.45 kg including batteries)

2. Reception Specifications

Reception system	FM: Double super heterodyne SSB and CW: Single super heterodyne
Intermediate frequency	FM: 1st IF 10.7 MHz 2nd IF 455 kHz SSB and CW: 10.7 MHz
Sensitivity	FM: −6 dB (20 dB QS) −8 dB (12 dB SINAD) SSB and CW: −10 dB (10 dB S/N)
Selectivity (60 dB)	FM: 25 kHz SSB and CW: 4.2 kHz
Squelch sensitivity	−14 dB
AF output	More than 1 W (into 8 ohms with 10% THD)
Load impedance	8 Ω

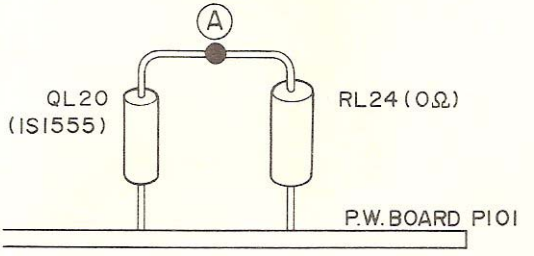
3. Transmission Specifications

Power output	1 W
Modulation	FM: Reactance modulation SSB: Balanced modulation
Maximum frequency tolerance	$\pm 10 \times 10^{-6}$ (−10 ~ 50°C)
Spurious attenuation	60 dB
Carrier suppression	40 dB
Undesired side band suppression	40 dB
Maximum deviation	±5 kHz

These specifications are subject to change without notice in the event of improvements.

CHANGING CHANNEL STEP TO 5k/12.5kHz

The channel step can be changed from 5k/25kHz to 5k/12.5kHz as follows. (For the details of Channel Step Switch, refer to ㉙ on page 5.)



Changing Procedure

1. Cut off lead Ⓐ between QL20 and RL24 to obtain 5k/12.5kHz channel step mode. When the leads are reconnected, the channel step returns to 5k/25kHz.
2. When lead Ⓐ is cut, the QL20 and RL24 become unstable. Take care not to short-circuit these parts.