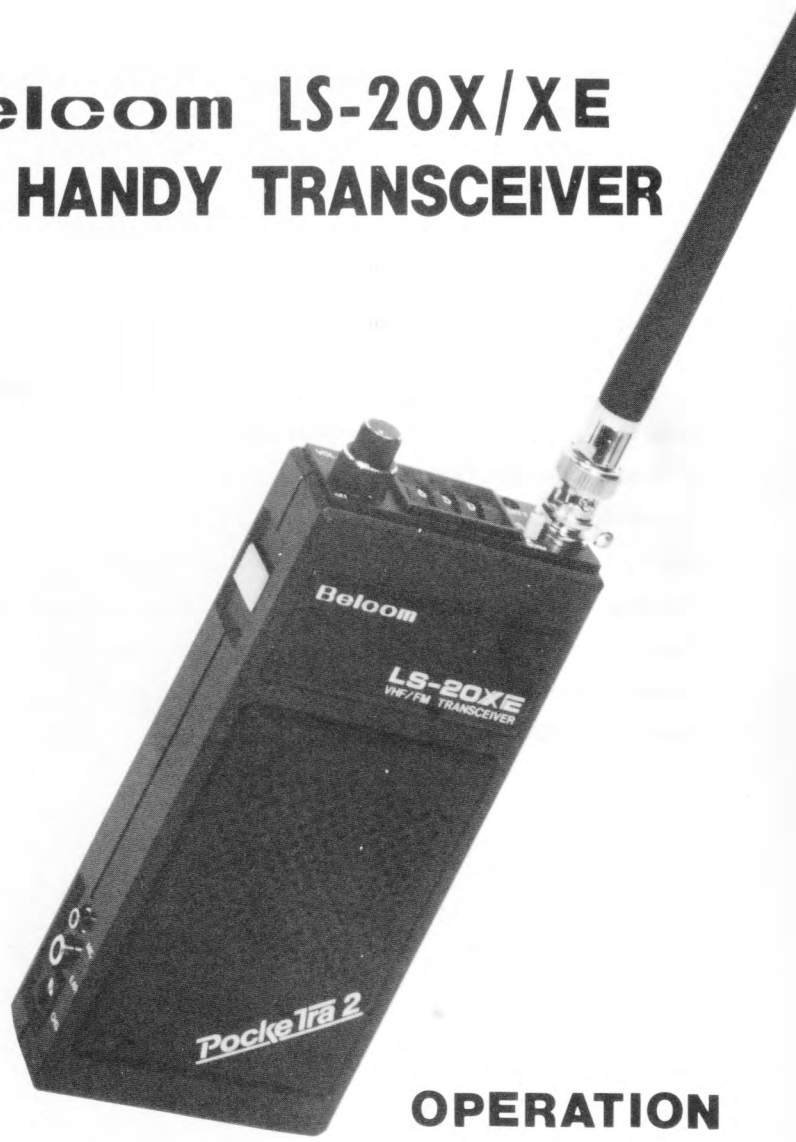
Belcom LS-20X/XE
2M HANDY TRANSCEIVER

Belcom



OPERATION MANUAL

PRINTED IN JAPAN

CONTENTS

General

1. The LS20X/XE is a compact handheld FM transeiver covering frequency ranges (subject to market requirements) between 140 and 150 MHz in 10 KHz (LS20X) or 5 KHz(LS20XE) steps.
2. The receiver section utilises the latest dual gate FET devices to ensure high sensitivity and dynamic range.
3. Power output of the LS20X/XE can be switched to 1W, 500 mW, or 100 mW by the user, so as to make maximum use of battery life.
4. By use of low power CMOS integrated circuit, sysnthesiser consumption has been reduced so as to extend battery life.
5. Wide range of accessories available to meet every requirement.

Accessory

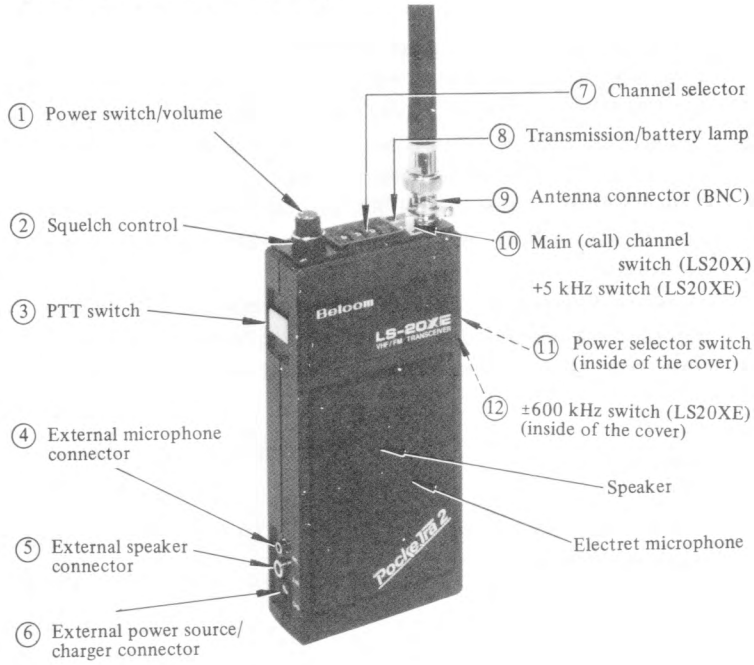
Standard accessories:

* Flexible antenna
* Hand strap
* Belt hanger
* Dry cell
* Operation manual

Optional accessories:

* SH-2 headset (see page 7)
* CA-610 AC changer 117V
* CA-610E AC charger 220V
* CS-612 mobile charger
* SH-1 speaker-microphone
* SFT-20 soft carring case
* CP-615 carring battery pack (without batteries)
* Nicad batteries AAA (4 pcs/1 pack)
* Wire antenna (BNC)

Functions/control — see diagram



① Power switch/volume

Turn clockwise to switch the set on, and continue rotating to increase receiver volume. Ensure that set is switched off when not in use.

② Squelch control

This adjusts the operating threshold of the squelch system. With the control rotated fully anticlockwise, the squelch is open and noise should be heard from the loudspeaker. To set the squelch, choose a vacant operating frequency, and adjust the squelch control slowly clockwise until the background noise is cut off. This is the most sensitive squelch setting. Further clockwise rotation of the squelch control will raise the threshold of operation, and thus only strong signals will be heard.

③ PTT switch

Depressing this switch changes the transceiver over from receive to transmit.

④ External microphone connector

This socket is for use with a remote microophone (2KΩ impendance), such as the optional SH-1 speaker/mic. If a plug is inserted into this socket, the internal microphone is disconnected.

⑤ External speaker connector

This socket is for connection of an external speaker (8 Ω impedance), such as the SH-1 speaker/mic. When a plug is inserted into this socket, the internal loudspeaker is disconnected. Connectors 4 and 5 will accept the SH-1 speaker/mic or SH-2 headset options.

⑥ External power source/charger connector

This socket allows direct connection to the battery pack, so can only be used when Nicad batteries are fitted. Do not use this socket for any connection, if batteris other than Nicad are fitted.

Two chargers are available, the CA610/E ac charger, and the CS612 dc mobile charger. See section "charging nickel cadnium batteries". If you wish to use your own dc external power source, first remove all batteries from the LS20X/XE, and connect 6V dc regulated supply using the external power socket. The center pin of the connector is the positive supply. **Take great care to observe correct polarity.**

⑦ Channel Selector

These three switches are for setting the transceiver to any desired operating frequency. The switches select MHz, 100 KHz and 10 KHz steps. For certain markets, a +5 KHz switch is also fitted so as to allow selection of 25 KHz channel spacing (LS20XE).

Example:

For 144.500 MHz	4	5	0	
For 145.700 MHz	5	7	0	
For 145.725 MHz	5	7	2	+ 5

⑧ Transmission/Battery indicator

This LED light during transmission. If the batteries are low, the lamp will not light, showing need for recharge or replacement (dry cells).

⑨ Antenna connector (BNC)

This allows connection of the supplied flexible antenna or any other 50 ohm antenna system.

⑩ Main (call) channel switch (LS20X)

Depressing this switch will instantly select the preset main channel (145.00 MHz). Subject to market requirements.
Releasing the switch returns frequency control to the channel selector.

+ 5KHz switch (LS20XE)

This switch allows selection of 25KHz channel spacing.

⑪ Power selector switch (inside of the cover)

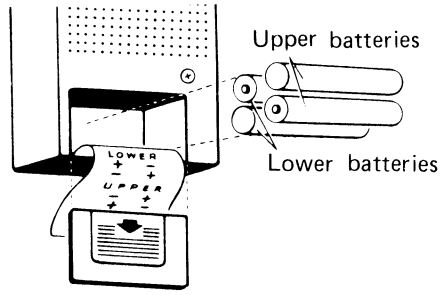
This switch has three position as follows: H = 1W
M = 500 mW
L = 100 mW

⑫ ± 600KHz switch (LS20XE) (inside of the cover)

This switch allows repeater offset.

Battery installation

Insert the four AAA size batteries into the base compartment as indicated in the diagram. Be very careful to observe battery polarity when installing.



Charging nickel cadmium batteries

Use the optional Nicad batteries and ac charger CA610/E. The LS20X/XE can be operated even when charging, although charging time will be longer than normal.
The Nicad batteries are fully charged in 14-16 hours.
The batteries can also be charged from a 12V dc supply by using mobile charger CS612.
Caution Neither charger nor external power source can be used if batteries other than nickel cadmium are used.
Allways remove the batteries if an external power supply (6V dc) is used.

How to operate

1. Remove the battery cover and install batteries, observing correct polarity.
2. Turn volume control clockwise to switch on the transceiver. Set squelch control as detailed in Functions/controls ② .
3. Mount the helical antenna, or connect an external antenna to the BNC connector.

4. Set frequency selectors to the required frequency.
5. The LS20X/XE are now ready for use. To transmit, press the PTT switch and speak at about 4 – 6 inches from the built in microphone.
6. (Home market). Depress main channel switch for instant operation 145.00 MHz. (LS20X)
7. For local contacts, set output power switch to "M" or "L" so as to reduce battery consumption.
8. Turn off power switch when the transceiver is not in use.

Troubleshooting

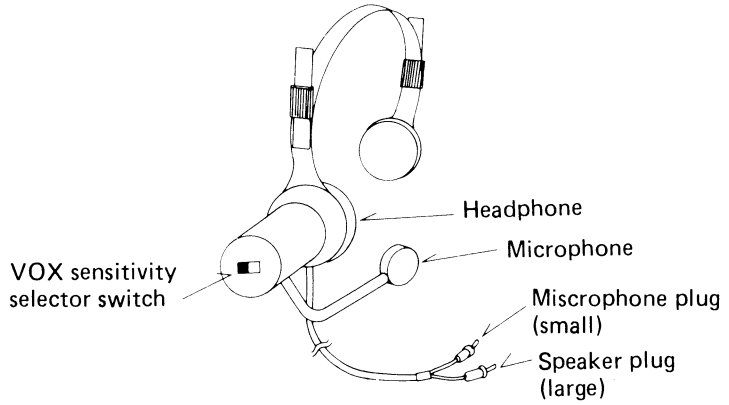
If the transceiver does not operate correctly, please check the following points:

Symptom	Check
No noise appears	Power switch on? Squelch control advanced too far Batteries exhausted or incorrectly loaded
Communication	Main channel switch depressed. (LS20X)
Impossible on required frequency	Frequency selector switches incorrectly set.
L.E.D. does not light when PTT operated	Batteries exhausted. Frequency set outside allowed range.

If you have any queries on the operation of the LS20X/XE, simply contact the dealer who supplied the unit to you, and they will be pleased to advise.

Operation of SH-2 headset

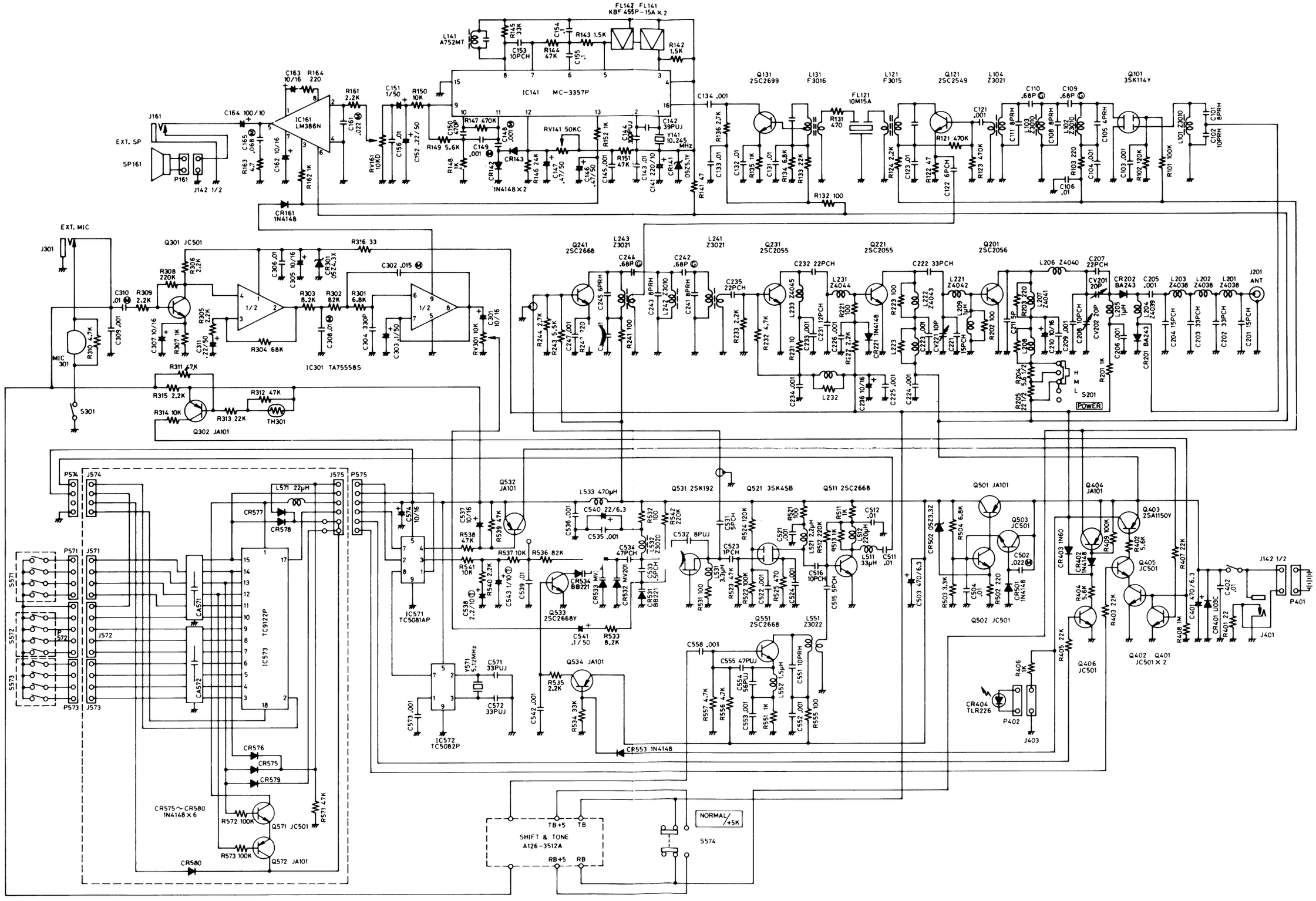
The SH-2 headset is a unique accessory for the LS20X/XE transceiver and allows completely "hands free" communication, thanks to its built in VOX system.



1. General features
   The headset fits over both ears and is lightweight so causes no discomfort. The open back construction allows easy listening to external sounds.
   The SH-2 is compact, but has built in VOX switching for the LS20X/XE transceiver.
   VOX sensitivity can be selected according to operating condtions.
   The VOX system is powered by LS20X/XE batteries, but consume s very little current.
2. Operation
   Insert 3.5 mm and 2.5 mm plug into MIC and EAR sockets of LS20X/XE.
   Set the VOX sensitivity switch to H or L according to background noise. Normal operation is in position H, but L may be used if there is lound background noise.

3. Fit the headset and adjust the microphone to a position about 3 cm from the mouth.
4. When you speak, the LS20X/XE will automatically switch to transmit.
   There is a built in 0.5 second delay before the unit switches back to receive after stopping speaking.
5. Adjust the listening level by the volume control of the LS20X/XE.

LS-20XE SCHEMATIC DIAGRAM



LS-20XE SCHEMATIC DIAGRAM SHIFT & TONE