ON TRANSMISSION:

1. Set channel selector to desired channel.
2. Press the PTT switch. Control will pass the PTT.
3. For private-line (PL) squelch operation, press the PL switch to set the PL squelch control to the PL setting.
4. For private-line operation, rotate the PL switch 90° until the noise stops (radio squelched).

TO RECEIVE:

1. Press the volume control clockwise to turn radio on. After noise indicator the radio.
2. Get channel selector to the desired channel.
3. Press the PL switch to set the PL squelch control to the PL setting.
4. Set channel selector to the desired channel and rotate the display until the noise stops (radio squelched).

TO INSTALL:

1. Place the antenna to the radio by screwing the antenna into the antenna.
2. Snap into place additional battery pack on top of the battery.
3. Snap the antenna into the antenna.
### Optional Features:

**TIME-OUT-TIMER**

(TOT, 60 SECONDS) - Transmission is limited to 60 seconds. An alert tone indicates that your transmission has been cut off. The alert tone continues until the PTT switch is released.

### QUIK CALL II™:

This option provides the user with the alerting feature of a pager.

**QUIK CALL II:**

If your radio is equipped with the Quik Call II option, rotate the Private-Line (PL) squelch control fully counterclockwise, past the detent, to the Quik Call™ enable (TX) position to set the radio to the paging mode. If your radio is in the Quik Call enable (RX) position when first turned on, rotate the PL/Squelch control clockwise, out of the Quik Call enable (RX) position and then counterclockwise, past the detent, into the Quik Call position to set the radio to the paging mode. Upon receiving a Quik Call (page alert), an interrupted tone will be generated to indicate that a valid page has been detected. The radio will remain in the unsquelched mode for approximately 30 seconds or until the PL/Squelch control is rotated clockwise as described above. If the Quik Call radio has not been manually reset within 30 seconds, the microcomputer will reset the radio back into the Quik Call mode.

Now transmit and receive as described in the basic operating procedure. When the conversation is complete, reset the radio as described above to receive the next page.

If the channel is changed while the radio is set to the paging mode, the radio will return to the carrier squelch mode and the above sequence to reset the radio to the paging mode will have to be performed.

To transmit, first monitor the channel by rotating the PL/Squelch control clockwise. When the channel is clear, rotate the PL/Squelch control clockwise as described in Step 6 of the TO RECEIVE section. Transmit and receive as described in the basic operating procedure. When the conversation is complete, rotate the PL/Squelch control fully counterclockwise past the detent, to reset the radio for the next page.
INTRODUCTION

To insure optimum performance of this radio, THIS OPERATING INSTRUCTIONS MANUAL MUST BE READ CAREFULLY AND COMPLETELY.

SAFETY INFORMATION

The Federal Communications Commission (FCC), with its action in General Docket 79-144, March 13, 1985, has adopted a safety standard for the human exposure to radio frequency (rf) electromagnetic energy emitted by FCC regulated equipment. Proper operation of this radio will result in user exposure substantially below the FCC recommended limits.

DO NOT hold the radio such that the antenna is very close to, or touching, exposed parts of the body, especially the face or eyes, while transmitting. The radio will perform best if the microphone is two or three inches away from the lips and the radio is vertical.

DO NOT hold the transmit switch (PTT) on when not actually desiring to transmit.

DO NOT allow children to play with any radio equipment containing a transmitter.

DO NOT operate a portable transmitter near unshielded electrical blasting caps or in an explosive atmosphere unless it is a type especially qualified for such use.

FCC REGULATIONS

Because this radio operates in FCC-regulated frequency bands, ALL RADIOS MUST BE LICENSED BY THE FCC BEFORE USE.

Because this radio contains a transmitter, Federal Law prohibits unauthorized personnel from adjusting or maintaining it.

INSPECTION AND MODEL INFORMATION

INSPECTION

- Remove and check the contents of the packing case to be sure that all items ordered have been included.

- Inspect the equipment thoroughly as soon as possible after delivery. If any part appears to be damaged in transit, report the extent of the damage to the transportation company immediately.

RADIO MODEL NUMBER: Example H23BEU7120AN

- The model number, serial number, and Motorola FCC designation number are all on a label attached to the bottom of your radio. The rf output power, frequency band, universal capability, type of squelch, and number of channels can be determined from the model number, as illustrated above.

- The specific frequency(s) that your radio is capable of transmitting and receiving is listed on a label located on the radio housing beneath the battery pack.

ANTENNA AND BATTERY PACK INSTALLATION

- Fasten the antenna to the radio by screwing the antenna into the antenna receptacle on top of the radio.

- Install the battery pack by first positioning the alignment dots as illustrated. Then, slip the top of the battery pack into the radio housing and snap the bottom of the battery pack into place. Additional battery information is available on page 4 of this booklet.
BATTERY INFORMATION

REPLACEMENT – With a screwdriver or coin, turn the spring-loaded latch on the bottom of the radio 1/8 turn in a counterclockwise direction and lift the battery pack from the radio housing. To install the new battery pack, position the alignment dots and slip the top of the battery pack into the radio housing. Snap the bottom of the battery pack into place.

NICKEL-Cadmium Batteries (Rechargeable) – Your Motorola nickel-cadmium rechargeable battery is a safe, dependable power source specifically designed for use in your high quality, high performance Motorola communications products. Proper care of your battery will insure its effectiveness allowing peak performance of your Motorola portable radio.

1. RECHARGE BEFORE USING – To insure optimum capacity and performance, your Motorola nickel-cadmium battery should always be charged before using. Your battery is designed to be used with a high quality Motorola charger. Charging in non-Motorola approved equipment may lead to permanent charger or battery damage and will void your warranty.

NOTE: To insure your battery attains a full charge in the allotted charge time (18 hours for standard charge or 3 hours for fast charge) the radio must be turned off. The radio may be turned off by rotating the ON—OFF/VOLUME CONTROL to the extreme counterclockwise position past the detent as shown on page 6.

2. CHARGING TEMPERATURE – Battery charging should occur, whenever possible, with your battery at about 77° F room temperature. Charging a cold battery (below 45° F) may result in leakage of electrolyte, and ultimately, in failure of the battery. Charging of a hot or warm battery (above 95° F) will result in reduced discharge capacity, affecting performance of the radio.

3. SHORT CIRCUITS – Care should be taken to avoid external short circuiting. Sustained high rate discharge (i.e., a paper clip placed accidentally across the contacts) will damage the battery and may create a burn or fire hazard.

4. MEMORY EFFECT – A nickel-cadmium battery may exhibit a memory effect (reduced charge capacity) due to long continuous overcharge or repetitive shallow cycling.

   Long Continuous Overcharge – If your battery is lightly or infrequently used, and it is allowed to charge over a long period (30 - 60 days), it may develop memory effect. That is, voltage may be sufficiently depressed on the first charging cycle to reduce the effectiveness of your radio transmission.

   Repetitive Shallow Cycling – A more common type of memory effect is induced by uniform shallow cycling. For example, if you call on your battery to repeatedly deliver 50% of its capacity, the remaining 50% can temporarily become inactive, and when called upon to deliver, may show a sharp decrease in its ability to deliver terminal voltage.

Any nickel-cadmium battery which shows early signs of reduced capacity should be checked for memory effect before being returned or discarded.

If your battery is exhibiting memory effect, memory can be easily eliminated by completely discharging the battery using an unsqueled radio, followed by a normal recharge. One or two deep cycles are usually sufficient.

5. ADDITIONAL INFORMATION – For additional information on Motorola's nickel-cadmium batteries, write to:

   MOTOROLA INC.
   BATTERY MARKETING DEPARTMENT
   8000 W. SUNRISE BOULEVARD
   FORT LAUDERDALE, FLORIDA 33322-9947

ACCESSORIES

REQUIRED ACCESSORIES

All antennas of a given type meet the same mechanical and electrical specifications. Therefore, slight variations in physical appearance and length will not degrade the electrical performance of a given antenna.

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>MODEL APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAD6502</td>
<td>Antenna, Helical (150.8-162.0MHz)</td>
<td>VHF only</td>
</tr>
<tr>
<td>NAE6483</td>
<td>Antenna, Flexible (450.0-470.0MHz)</td>
<td>UHF only</td>
</tr>
<tr>
<td>NTN5453</td>
<td>Nickel-Cadmium Battery</td>
<td>All</td>
</tr>
<tr>
<td>NTN4865</td>
<td>Urethane Carrying Holder</td>
<td>All</td>
</tr>
<tr>
<td>NTN4861</td>
<td>Compact Battery Charger</td>
<td>All</td>
</tr>
</tbody>
</table>

OPTIONAL ACCESSORIES

Motorola offers several accessories to increase your communications efficiency. Consult your Motorola sales representative for a complete list of equipment. Various accessories are listed below.

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTN1032</td>
<td>Standard Urethane Carry-Case</td>
</tr>
<tr>
<td>NTN1033</td>
<td>Urethane Carry-Case, Detachable Swivel Type</td>
</tr>
<tr>
<td>NTN5241</td>
<td>Urethane T-Strap</td>
</tr>
<tr>
<td>NTN5242</td>
<td>Leather 2.5-inch Swivel Belt Loop</td>
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<tr>
<td>NTN5243</td>
<td>Carry Strap, Black</td>
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<tr>
<td>NTN4864</td>
<td>Single-Unit, Rapid Rate Battery Charger (117 VAC)</td>
</tr>
<tr>
<td>NTN5196</td>
<td>Multi-Unit, Rapid Rate Battery Charger (117/230 VAC)</td>
</tr>
<tr>
<td>NTN5244</td>
<td>Wall Mount, Multi-Unit Battery Charger</td>
</tr>
<tr>
<td>NTN5245</td>
<td>Rack Mount, Multi-Unit Battery Charger</td>
</tr>
<tr>
<td>NTN4849</td>
<td>Remote Microphone</td>
</tr>
</tbody>
</table>
CONNECTORS, CONTROLS, INDICATORS, AND SWITCHES

Antenna
Heliflex or whip with threaded base.

On-Off/Volume Control
Turns the radio on and off and adjusts the volume level.

Antenna Receptacle
Attaches the antenna to the radio.

LED Indicator
A light-emitting diode (LED) indicates normal transmission (continuous red), or low battery (flickering red).

Push-To-Talk (PTT) Switch
When depressed and held, engages the transmitter/encoder and puts radio in the transmit mode. When released, the radio operates in the receive mode.

Frequency Select Switch
Selects the operating channel.

Universal Connector Jack
Connects an external speaker-microphone to the radio. To attach an external speaker-microphone, first “pop” the protective cap away from the universal connector jack. Check for proper plug to jack alignment and make the connection by inserting the plug. Tighten the threaded collar. The radio’s internal speaker is inoperative while an external speaker-microphone is connected to the universal jack. When not in use, keep the universal jack covered with the protective cap.

High Low Power Switch
Puts radio in either the high or low power mode.

PL Squelch Control
Mutes background noise and reduces unwanted signals while in the receive mode. Switch detent turns Private-Line (PL) feature on (ON) or off (PL models only). Switch detent is non-functional on carrier-squelch radios.

**ALERT TONES/INDICATORS**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Up</td>
<td>1640Hz for 0.5 seconds if the self check is OK and Good Radio Alert enabled.</td>
</tr>
<tr>
<td>Synthesizer Unlock (Rx)</td>
<td>1640Hz continuous if the self check is OK and Good Radio Alert enabled.</td>
</tr>
<tr>
<td>Synthesizer Unlock (Tx)</td>
<td>1640Hz interrupted if the self check is OK and Good Radio Alert enabled.</td>
</tr>
<tr>
<td>TOT</td>
<td>820Hz continuous until release of PTT.</td>
</tr>
<tr>
<td>Quik Call II</td>
<td>1640Hz, 142ms on/off for duration of Tone B.</td>
</tr>
<tr>
<td>Blank Tx Channel</td>
<td>820Hz continuous until release of PTT.</td>
</tr>
<tr>
<td>Low Battery</td>
<td>LED flashing 142ms on/off until release of PTT.</td>
</tr>
<tr>
<td>Transmit Indicator</td>
<td>LED continuous until release of PTT, unless the LED has been disabled.</td>
</tr>
</tbody>
</table>
BASIC OPERATING PROCEDURE

TO RECEIVE: (steps 1 through 8)
1. Rotate the volume control one-half turn clockwise to turn on the radio. A
   power-up alert tone is generated for approximately one-half second to
   indicate that the radio has passed a self test of the microphone.
2. Set the frequency select switch/knob to the desired channel position.
3. For PL squelch operation, proceed to step 8.
4. For carrier squelch operation (carrier squelch and PL models), rotate the
   (tl) PL/squelch control to the fully counterclockwise position, before detent.
5. Listen for channel activity and set the volume control to a comfortable
   listening level.
6. When the channel is clear, slowly rotate the (tl) PL/squelch control in a
   clockwise direction until the noise just stops (radio squelched). Do not
   adjust this control further. Excessive squelch reduces the radio sensitivity.
7. Your radio is now set to receive all calls on your frequency.
8. For PL operation (Private-Line models only), rotate the (tl) PL/squelch
   control fully counterclockwise, past detent, to the PL on (tl) position. Your
   radio is now set to receive only those calls coded for the radio.

TO TRANSMIT: (Steps 9 through 12)
9. Set the frequency select switch/knob to the desired channel position.
10. Do not interrupt another user. Listen for activity on your channel. If your
    radio is a Private-Line model, momentarily turn the PL/squelch switch
    clockwise (off detent-carrier squelch operation) to monitor the channel. The
    channel must be clear before transmitting.
11. Hold the radio in a vertical position with the speaker-microphone grille two to
    three inches from your mouth and speak in a normal tone of voice.
12. Press the PTT switch on the side of the radio and speak slowly and clearly
    into the grille area. When finished transmitting, release the PTT switch to
    receive. Remember, if you transmit while the other party is talking, you will
    not be heard.
13. To turn the radio off, rotate the volume control counterclockwise until a click
    is heard and the mechanical stop is reached.

NOTE

PL models - After monitoring the channel, remember to return the
PL/squelch switch fully counterclockwise, past detent (PL on), to receive
only PL coded messages.

OPTIONS OPERATION

QUIK CALL II OPTION
Radios equipped with this option provide the user with the talk-back features of a
pager.

STANDARD OPERATION
When the radio is turned on, a short power-up alert tone will be heard. The
radio is in the carrier squelch mode and operates as described in the basic
operating procedure.

QUIK CALL II (PAGING) MODE
If your radio is equipped with the Quik Call II option, rotate the Private-Line (PL)
Squelch control fully counterclockwise, and then press the detent to the Quik Call enable
(tl) position to set the radio to the paging mode. If your radio is in the Quik Call enable
(tl) position when first turned on, rotate the PL/squelch control clockwise, out of the Quik Call enable
(tl) position and then counterclockwise, past the detent, into the Quik Call position to set the radio to the paging mode.
Upon receiving a Quik Call (page alert), an interrupted tone will be generated to
indicate that a valid page has been detected. The radio will remain in the
un-squelched mode for approximately 30 seconds or until the PL/squelch control
is rotated clockwise as described above. If the Quik Call radio has not been
manually reset within 30 seconds, the microcomputer will reset the Quik Call radio
back into the Quik Call mode.

Now, transmit and receive as described in the basic operating procedure. When
the conversation is complete, reset the radio as described above to receive the
next page.

If the channel is changed while the radio is set to the paging mode, the radio will
return to the carrier squelch mode and the above sequence to reset the radio to
the paging mode will have to be performed.

To transmit, first monitor the channel by rotating the PL/squelch control
clockwise. When the channel is clear, rotate the PL/squelch control clockwise
as described in Step 6 of the TO RECEIVE section. Transmit and receive as
described in the basic operating procedure. When the conversation is complete,
rotate the PL/squelch control fully counterclockwise, past the detent, to reset the
radio for the next page.

TIME-OUT-TIMER
Radios equipped with this option limit a single transmission to sixty seconds.
The transmitter emits an audible alert tone, signalling the operator that the sixty-
second limit has been exceeded. The user can again key-up for the next
transmission once the PTT switch has been released.

TOUCH-CODE DUAL TONE MULTIPLE FREQUENCY (DTMF)
Radios equipped with this option have a 3X4-inch keypad on the front of the
radio. Turn the radio on, depress and hold the PTT switch down, and press the
appropriate Touch-Code button.
GENERAL RADIO CARE

1. Avoid physical abuse of your radio such as carrying it by the antenna or remote microphone.

2. Wipe the battery contacts with a lint-free cloth to remove dirt, grease, or other material which may prevent good electrical connections.

3. The antenna jack is fitted with a protective cap which should be left in place when the jack is not being used.

4. When not in use, keep the universal jack covered with the protective cap.

5. Clean the radio exterior using a cloth moistened with water. See CAUTION.

CAUTION

Use of chemicals such as detergents, alcohol, aerosol sprays, and/or petroleum products may be harmful and damage the radio housing and cover.

IF YOU EXPERIENCE DIFFICULTY:

Check the following items before requesting service.

1. Review steps in Basic Operating Procedure.

2. Be sure the frequency selector switch is set to the correct channel.

3. If you cannot receive in fringe areas, check the squelch control setting. It must be set to threshold position as described in the basic operating instructions.

4. If operation is poor, check the antenna. It must be undamaged and operated in the vertical position for maximum range.

5. Try several different operating locations.

6. Replace or recharge the battery.

COMPUTER SOFTWARE COPYRIGHTS

The Motorola products described in this manual may include copyrighted Motorola computer programs stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form the copyrighted computer program. Accordingly, any copyrighted Motorola computer programs contained in the Motorola products described in this manual may not be copied or reproduced in any manner without the express written permission of Motorola. Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents or patent applications of Motorola, except for the normal non-exclusive royalty-free license to use that arises by operation of law in the sale of a product.

TEPF-11413-B
OPERATING INSTRUCTIONS QUESTIONNAIRE

We believe that reports from users provide valuable information for producing quality operating instructions. Your comments and answers to the following questions will aid us in preparing manuals that contain accurate and complete information of maximum benefit to you.

In reference to Manual No. 68P8055C65-A
HT50™ Portable Radios

1. Please check all the appropriate boxes:

<table>
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<tr>
<th>Controls and Features</th>
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<th>text</th>
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<th>too detailed</th>
<th>too brief</th>
<th>adequate</th>
<th>complete</th>
<th>incorrect</th>
<th>not covered in this manual</th>
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<tbody>
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<td>Operating Procedures</td>
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<td>illustrations</td>
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<tr>
<td>Alert Tone Explanations</td>
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</table>

2. For illustrating procedures, do you prefer:
- [ ] photographs
- [ ] line drawings
- [ ] no preference

3. How would you rate the overall organization of this manual?
- [ ] excellent
- [ ] very good
- [ ] good
- [ ] fair
- [ ] poor

4a. If this manual has a "quick reference card," do you use it?
- [ ] yes
- [ ] no

b. If yes, how useful is it to you?
- [ ] extremely
- [ ] very
- [ ] somewhat
- [ ] not very

5. How do you rate this manual overall?
- [ ] excellent
- [ ] very good
- [ ] good
- [ ] fair
- [ ] poor

6. Comments/Recommendations for improving operating instructions.

__________________________________________

__________________________________________