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Client: Dynon Avionics Inc.
Model: DX15
FCC ID: WU6-101204-000
Standard: FCC Part 87
Report #: 2009191

Appendix J: Manual

Please refer to the following pages.

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DX15 Manual Text

Page last modified: 6/19/2009 3:29 PM

RSS or

Contents:

Preliminary

= information needed

= non-final nomenclature

Case 10327

Original Handheld Radio Manual work

Terminology:

- buttons / ~~keys~~
- keypad / ~~button pad~~
- Buttons are pushed / ~~pressed~~
- Squelch is opened / ~~unlocked~~ / ~~broken~~
- Wall Power Adapter / ~~Wall Charger~~
- Vehicle Power Adapter

Front cover

(graphic - DX15)

DX15 Handheld VHF Air Band Transceiver

Operation Manual
P/N 101219-000, Revision A
For use with firmware version 1.00

May, 2009

Dynon Avionics

Inside Front Cover

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Dynon Info

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Dynon Avionics offers online sales, extensive support, and continually-updated information on its products via its Internet sites:

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- docs.dynonavionics.com – Current and archival documentation
- downloads.dynonavionics.com – Software downloads
- support.dynonavionics.com – Support resources
- store.dynonavionics.com – Dynon's secure online store for purchasing all Dynon products 24 hours a day.
- wiki.dynonavionics.com – Dynon Avionics' Documentation Wiki provides enhanced, extended, continuously-updated online documentation contributed by Dynon employees and customers.
- forum.dynonavionics.com – Dynon Avionics' Internet forum where Dynon customers can interact and receive Dynon technical support outside of telephone support hours. A key feature of the forum is that it allows the exchange of diagrams, photos, and other types of files.
- newsletter.dynonavionics.com – Dynon's email newsletter.
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Important Radio Frequency Energy Safety

! *Warning!*

While transmitting, your DX15 Handheld VHF Air Band Transceiver emits Radio Frequency (RF) Electromagnetic Energy. Please take the time to familiarize yourself with the properties of and the proper methods of using this device.

Maintain at least a 3-inch (5 cm) gap between this device and your body while transmitting

Do not transmit without an antenna attached. Transmitting without an antenna attached may cause damage to the DX15.

Do not transmit, or allow this device to transmit in areas or conditions that are inherently hazardous in the presence of radio transmissions, such as hospitals, in the vicinity of blasting (blasting caps), and around robotic systems.

Additional Important Safety Information

! *Warning!*

Your DX15 Handheld VHF Air Band Transceiver uses Lithium-Ion batteries. Lithium-Ion batteries are safe when used as directed, but can also be hazardous if they are not used in accordance with their instructions.

Only charge batteries from Dynon Avionics on Dynon Avionics chargers. Using non-Dynon chargers to charge Dynon batteries could cause them to explode.

Do not dispose of Dynon-supplied Lithium-Ion batteries (or any other) in fire or otherwise expose them to excessive heat.

Do not short-circuit the contacts of Dynon-supplied (or any other) Lithium-Ion batteries. This is

most often accidentally done with with small, loose metallic objects, such as coins or keys.

Please dispose of non-functional batteries in a responsible manner. The batteries for your DX15 Handheld VHF Air Band Transceiver are very similar to cellular telephone batteries, and likely can be recycled whereever cellular telephone battery recycling is available. For a list of recycling locations in your area (USA only), call 1-800-8-BATTERY (800-822-8837) or see the Call 2 Recycle website at www.rbrc.org.

! *Caution!*

This device is designed to operate safely only with Dynon-supplied batteries and power supply accessories.

Do not operate this device without the supplied Dynon battery pack installed.

Do not operate Dynon power supply accessories at input voltages other than those recommended.

Do not operate this device without an antenna installed. Doing so may damage the device.

This device is not waterproof. While care has been taken in its design to operate safely and reliably in conditions such as light rain, it is not designed to be used in severe wet conditions.

Do not operate this device below xx°F (-xx°C) or above xx°F (xx°C). Exposing this device to prolonged sunlight may result in excessive high temperatures.

Do not drop this device, especially onto hard pavement (or from great height).

Do not operate this device at high volume levels when using a headset. If you experience ringing in your ears, reduce the volume or do not use this device.

Do not attempt to modify or repair this device - there are no user-servicable parts inside. Doing so will void the warranty and may result in unauthorized transmissions.

FCC Licensing Requirements (USA Only)

Per the FCC (http://wireless.fcc.gov/services/index.htm?job=operations&id=ground_stations) *You may only use your hand-held aviation VHF radio from your aircraft, or under the authority of an FCC ground station authorization. Ground station authorizations are usually only issued to aviation service organizations located on airports, businesses engaged in pilot training, aircraft manufacturers, or persons engaged in chase activities related to soaring and ballooning.*

Per the FCC (http://wireless.fcc.gov/services/index.htm?job=licensing&id=aircraft_stations) *... you do not need a license to operate a two-way VHF radio, radar, or emergency locator transmitter (ELT) aboard aircraft operating domestically. All other aircraft radio stations must be licensed by the FCC either individually or by fleet. Aircraft operating domestically do not land in a foreign country or communicate via radio with foreign ground stations. Flying in international or foreign airspace is permitted, so long as the previous conditions are met. If you travel to a foreign destination, however, (e.g., Canada, Mexico, Bahamas, British Virgin Islands) a* USA *license is*

required.

Table Of Contents

(To be generated when ported to Microsoft Word.)

Introduction

Congratulations on your purchase of the Dynon Avionics DX15 Handheld VHF Air Band Transceiver.

Your DX15 is a compact, easy-to-use handheld tranceiver for aviation use, and includes the following standard features:

- Compact, handheld size
- Lithium-Ion 1300 mAh Battery Pack
- Backighting of both display and keypad
- Dedicated Emergency button for single button tuning of 121.5 MHz
- Keypad Lock
- On-screen battery capacity meter
- Adjustable sidetone for (optional) headset connection
- Scanning of entire air band, memory frequencies, and most recently used frequencies
- External power, headset/microphone/PTT, and antenna connections
- Easy recall of last 10 frequencies used (Most Recently Used - MRU)

Your DX15 is an ideal transciever for:

- Keeping in your flight bag - just in case!
- Listening to the tower at air shows!
- Family members listening to flight communications
- Monitoring nearby airfields
- Backup aircraft communications
- Budget radio capability inultralight and experimental aircraft

Visual Tour

Graphic - Top View

Antenna connector

PWR/VOL knob

TX/RX indicator (Red when transmitting, Green when receiving)

Graphic - Front View

Display

Emergency button

Keypad

Speaker

Mic

Graphic - Front, Close-in on display

Transmit icon

Receive icon

Keypad Lock icon

Frequency display (6 digits)

Battery Status icon

Memory Mode icon

Memory Channel display (2 digits)

Graphic - Front, Close-in on keypad

LOCK button

Digits buttons

< and **>** buttons

MEM button

LIGHT button

SQL button

CLR button

Graphic, Left Side

Transmit / Push To Talk (PTT) button

^ and **v** buttons

Graphic, Right Side

Speaker jack

Microphone jack

DC IN jack

Graphic, Back

Battery Release clips (sides)

Belt Clip recepticle

Desktop Rapid Charger terminals

Assembling and Operating Your DX15 - Quick Start

Note: While you can take your DX15 right out of the box and use it immediately with the instructions below, the battery is shipped only partially charged. Although the Li-Ion battery used in your DX15 does not have any "memory effects" that require a full charge before first use, we reccomend that you fully charge your DX15 before using it for prolonged periods. See the section Charging The Battery for details.

1 - Insure that power is OFF - rotate the PWR/VOL control counter-clockwise until it clicks.

2 - Screw the supplied antenna onto the antenna connector, clockwise, using light finger pressure (do not tighten excessively). (Graphic showing clockwise rotation)

3 - Snap in the supplied battery pack, mating the two tabs on the bottom of the battery with the associated slots on the battery recepticle. Gently, click the upper part of the battery into place. (Graphic showing proper battery insertion, slots, tipping up, and clicking in.)

Operating Your DX15 - Quick Start

1. Rotate the PWR/VOL knob clockwise, adjusting the volume to the 10:00 to 2:00 position depending on the volume desired.

2. Set the desired frequency:

- The decimal point ("."), and trailing digit is rounded to the nearest 0.025 MHz (25 KHz) and automatically inserted onto the display, so to set a frequency of 128.775, type the following:

1 2 8 7 7

The display should then read:

128.775

To set a frequency of 122.300, type the following:

1 2 2 3 0

The display should read:

122.300

At this point, 122.300 is tuned and you are now able to transmit and receive communications on this frequency.

To transmit, press and hold the push-to-talk button on the left side of the radio.

! *Warning!*

Do not transmit unnecessarily or without authorization!

Unpacking Your DX15

Inside your DX15 box, you should find the following:

- 101204-000 DX15 Handheld VHF Air Band Transceiver
- 100993-000 Flexible Antenna
- 100965-000 7.4V 1.3Ah Lithium-Ion Battery With Belt Clip
- xxxxxx-xxx Lanyard
- 100846-000 Wall Wall Power Adapter
- 101219-000 DX15 Operation Manual
- xxxxxx-xxx DX15 Registration Card

Registration Card:

Dynon strongly recommends that you fill out and send in the registration card, as this will allow Dynon to contact you with updates and new product announcements.

Assembling Your DX15

1. Remove all components from plastic bags, remove twist-ties on cables, and peel the film from the display.

2. Screw the supplied antenna onto the antenna connector, clockwise, using light finger pressure (do not tighten excessively). (Graphic showing clockwise rotation)

3. Gently insert the supplied battery pack:

- Mate the two tabs on the bottom of the battery with the associated slots at the bottom of the battery area.
- Gently, click the upper part of the battery into place.
- The two spring-loaded latches on the sides of the battery should now be in the up position.

(Graphic showing proper battery insertion, slots, tipping up, and clicking in.)

4. (Optional) Insert the supplied lanyard into the lanyard tab as illustrated.

(Graphic showing lanyard insertion.)

Your DX15 is now ready for use

Note: The battery is shipped only partially charged. Dynon reccomends that you fully charge your DX15 before using it for prolonged periods. See the section Charging The Battery below for details.

Charging The Battery

Your DX15's is equipped with a rechargable Lithium-Ion battery pack.

To charge your DX15:

- Connect the AC-DC adapter to the DX15's DC IN as illustrated (graphic of plug being inserted into DC In jack)
- Plug the AC-DC adapter into a 110V AC outlet (graphic of wall outlet insertion)

Whenever your DX15 is connected to external power, it will charge the battery, even when your DX15 is being used to receive and transmit. During charging the Battery Status icon will animate to indicate that it is charging. Additionally, the bars on the interior of the Battery Status icon will display the approximate state of the charge. When charging is complete, the Battery Status icon be on solid and the bars will extend through the entire length of the Battery Status icon.

A fully-discharged battery will require approximately xxx hours to fully recharge via the DC IN if the DX15's power is off. While your DX15 can be used to receive and/or transmit during charging, such usage during charging will increase the time it takes for the battery to fully recharge.

If you are using your DX15 as a backup trasceiver that will be stored without being used for long periods, the battery will hold its charge longest if it is disconnected from the radio. Store the battery so that its electrical contacts are not able to be shorted by surrounding metal objects. Charge your battery every xxx months to keep it fully charged should it be needed in an emergency.

Unlike older battery technologies, Lithium-Ion batteries do not suffer adverse affects if they are not fully charged or discharged. As with all rechargable batteries, the usable capacity of your DX15's battery will decrease with time and usage. Replacement batteries can be obtained from Dynon Avionics and authorized dealers.

Basic Functions

Power On / Off

(Graphic showing PWR/VOL knob, with clockwise rotation symbol)

Power ON:
Rotate the PWR/VOL knob clockwise until it clicks. The TX/RX indicator and backlighting should illuminate for approximately 1 second to indicate that they are working. The display will show all icons and digits for a moment to indicate that they all work.

Power OFF:
Rotate the PWR/VOL knob counter-clockwise until it clicks.

Volume Adjustment

With power On, rotate the PWR/VOL knob clockwise to increase volume, counter-clockwise to decrease volume.

Note: It may be useful to adjust Squelch so that the speaker is active during Volume Adjustment - see the section Setting Squelch for details.

Transmitting

To transmit on the tuned frequency, press and hold the Push To Talk button on the left side of your DX15 while speaking into the microphone on the front of the tranciever.

Backlight On / Off (LIGHT Button)

The backlight can be turned on or off by pressing the LIGHT button at any time.

Note: The functionality of the LIGHT button can be changed affecting Backlight On / Off - see the section Advanced Settings for details.

Setting Backlight Brightness

To adjust the brightness of the backlighting:

- Push and hold the LIGHT button until it says LitE-X, where X represents the current backlight level.
- Adjust the backlight level by using the **<** and **>** buttons.
- The display will show 1 through 9.
- To exit, push the LIGHT or CLR button.

Setting Squelch

Squelch silences the speaker, eliminating the background noise present on all frequencies even when no signal is being received. Squelch is adjusted to keep the speaker muted except when a signal is being received on the frequency that is being monitored.

Note: The functionality of the side **^** and **V** buttons can optionally be set to adjust Squelch all the time. See the section Advanced Settings for details. These instructions reflect the FACTORY DEFAULT behavior of the side **^** and **V** buttons.

Note: Squelch can be changed in any mode or menu; upon exit of setting Squelch, the previous menu or mode will return / continue.

To Set Squelch:

- Push the SQL button
- Using the **<** and **>** buttons on the keypad or the side **^** and **V** buttons, adjust the squelch setting from 0 to 24.
- Setting Squelch to 0 results in static being heard when no signals are being received (no Squelch being applied). (**Note:** This will drain the battery more quickly.)
- Setting Squelch to 24 means that only a signal that is extremely strong will break Squelch (un-mute the seaker) and be heard.
- Typically Squelch is set to the lowest setting that causes all background noise to be muted, but allows actual signals to be received. The Squelch setting may need to be adjusted in

different environments and conditions.

Exit Setting Squelch mode by:

- Pushing the SQL button on the keypad;
- Pushing the CLR button on the keypad;
- Waiting approximately 5 seconds;
- Pushing the Emergency button;
- Pushing the Push To Talk button

The previous menu or mode will return / continue.

Setting Frequency - 121.500 MHz (Emergency button)

Push and hold the orange Emergency button. The digits
1 2 1 . 5 0 0
appear on the display at approximately 1/3 second intervals. When the last digit has appeared,
121.500 is tuned, and the Emergency button can be released.

Your DX15 is now ready to receive and transmit on 121.500 MHz.

Note: If the Emergency button is release before all digits of 121.500 are displayed, the frequency
will return to its previous setting.

Setting a Frequency Directly

Note: The "Assume leading 1 / 100 MHz" setting will change this behavior - see the Advanced
Settings section for details. The instructions below reflect the FACTORY DEFAULT behavior of
the "Assume leading 1 / 100 MHz" function.

If the radio is in another mode, such as Scan, Memory Recall Mode or Most Recently Used
Frequency Recall Mode, exit these modes first by pushing the CLR button on the keypad in order
to set a frequency as described below.

Example
To enter the frequency 128.775, you would enter:

1 2 8 7 7

The display should then read:

128.775

The decimal point (".") is automatically entered for you.
The last digit is automatically rounded to the nearest 0.025 MHz (25 KHz) since there is only one
possible choice for it once the first five digits are typed.

This frequency is now tuned and you can receive and transmit to other radios that are also tuned
to the same frequency.

Band Scanning

Band scanning rapidly checks every frequency within your DX15's operating range of 118.000 MHz through 136.975 MHz in 0.025 MHz (25 KHz) steps (118.025, 118.050, 118.075, etc.) sequentially. In Band Scanning mode, the DX15 will pause on frequencies that have a strong enough signal to break squelch so that they may be heard.

To enter Band Scanning Mode:

Exit any other mode (such as MEM mode) by pushing the CLR button on the keypad.

Adjust Squelch (see section Setting Squelch for details) so that the speaker is quiet. If a signal is received during scanning, the scanning will pause, allowing you to listen to the received signal. When band scanning, your DX15 may receive a variety of signals at widely-varying signal strengths. Setting Squech too high will allow only the very strongest signals to be heard. Setting Squelch too low will result in the scan being stopped frequently, often on noisy frequencies that cannot be understood. Thus, setting Squelch properly for band scanning will necessarily be a compromise.

To scan up push and hold (for at least 1 second) the **>** button. To scan down push and hold the **<** button.

During Band Scanning (or any of the other scan operations - see section Memory Scanning and Last Ten Frequencies Scanning for details), the decimal point between the digits flashes to indicate that a scanning mode is active.

When a signal is received that exceeds the Squelch setting, Scan Mode will pause for as long as the signal is being received. Scanning will resume a few seconds after the last signal is received. To force the radio to continue scanning while a frequency is being received, press either the **<** or **>** button to "nudge" it off the frequency currently being received.

When the end of the band is reached, scanning will continue, in the same direction, from the other end of the frequency range. The direction of scanning can be changed by pressing **<** or **>**.

Band Scanning can be stopped by:

- Pushing the CLR button
- Pushing PTT
- Pushing the Emergency button

Keypad Lock

Keypad Lock is used to protect against accidental button pushes, such as when your DX15 is worn on a belt and you want to monitor only a single frequency.

To activate Keypad Lock:

- Press and hold the the LOCK button.
- After a moment, the Keypad Lock icon will appear on the display.

Keypad Lock inhibits keypad buttons / behaviors except the following:

- Push To Talk (PTT) button works normally

- Emergency button works normally
- The LIGHT button works normally

To exit from Lock Mode

- Push and hold the LOCK button until the Keypad Lock icon dissapears.
- All keypad buttons / behaviors will now function normally.

Battery Monitoring

The bars on the interior of the Battery Status icon will display the approximate remaining capacity of the battery.

graphic of various states of charge - 100/80/60/40/20 % (if it's 5 bars) or 100/75/50/25 % (if it's 4 bars)

When only one bar is displayed, very little capacity remains and you should consider charging the battery or installing another battery.

Recalling Most Recently Used (MRU) Frequencies

Note: To use MRU Frequencies, the Side buttons used for Direct Squelch behavior must be set to **OFF** (factory default).

MRU Frequencies are the ten (10) frequencies that were most recently used. Think of them like an extended version of the flip flop feature on many panel-mounted aviation radios.

To recall a MRU Frequency:

- When in no other Memory or Scan Mode, push the **^** or **v** buttons on the side to enter MRU recall mode.
- The first button push on either button will recall r0, which is your current frequency.
- The ten (10) most Recently Used Frequencies are displayed as r0 (most recently used) through r9 (10th most recently used).
- Press **^** and **v** to cycle through the Most Recently Used frequencies.

MRU Frequencies can be scanned by pressing and holding **<** or **>** for 2 seconds, similar to band scanning. To stop scanning your MRU Frequencies, push the CLR button.

A frequency is added to the list of MRU Frequencies when:

- A frequency is manually entered from the keypad
- A frequency on which a signal is received for more than two (2) seconds during scanning
- A frequency that was transmitted on for more than two (2) seconds
- The frequency that was displayed when MRU mode was entered.

Note: Any particular frequency is only stored once as a MRU Frequency. Example: if 118.500 is manually entered, several MRU Frequencies are selected, and then 118.500 is manually entered again, it will not be stored as a MRU Frequency a second time.

Using Memory Channels

Storing Frequencies Into Memory Channels

- Select a frequency
- Push and hold the MEM button for one to two (1-2) seconds
- MEM-xx will be displayed, where xx is the lowest (next) empty memory channel location
- If a different mem ory channel is desired:
    - Press the **<** and **>** or the **^** and **v** buttons to decrement or increment, respectively, the memory channel to be used to store the current frequency
    - Using the numeric keypad, enter the two-digit memory channel to be used to store the current frequency
- To store the frequency, push the MEM button. MEM-xx will flash momentarily
- Your DX15 will be now be in Memory Channel mode, on the just-stored Memory Channel.

Push the CLR button to exit Memory Channel mode at any time.

Note: If all 100 Memory Channels have frequencies stored, Memory Channel 99 will be selected and if a new Frequency is stored, the frequency stored in Memory Channel 99 will be overwritten.

Recalling Memory Channels

- Exit any other mode (such as scan) by pushing the CLR button on the keypad.
- Push the MEM button momentarily (enters Memory Channel mode)
- (0-9) - push and hold the 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9 button for more than 1 second
- (10-99) - push the two-digit Memory Channel Number
- Scroll - use the **<** and **>** or **^** and **v** buttons to scroll through memories.

(At any time...) Push the CLR button to exit Memory Channel mode.

Note: Any Memory Channels that do not have a Frequency stored will be skipped.

Deleting Memory Channels

- Recall a Memory Channel as described above
- Push and hold the CLR button for one to two (1-2) seconds
- MEM-xx will flash twice
- The selected Memory Channel no longer has a Frequency programmed into it.
- Other Memory Channels are not affected when an individual Memory Channel is deleted.
- You are now in Memory Channel mode, on the next Memory Channel that has a location stored in it.

Push the CLR button to exit Memory Channel mode at any time.

Note: When a Memory Channel is deleted, the Skip Tag (if any) for that Memory Channel is also deleted.

Scanning Memory Channels

- Exit any other mode (such as scan) by pushing the CLR button on the keypad.
- Push the MEM button momentarily (enters Memory Channel mode)
- To scan up (from current Memory Channel towards highest Memory Channe), push and

hold (for at least 1 second) the **>** button.

- To scan down (from current Memory Channel towards lowest Memory Channe), push and hold (for at least 1 second) the **<** button.

Note: Only Memory Channels that have a frequency stored in them will be scanned.

During Memory Channel scanning (or any of the other scan operations), the decimal point between the digits flashes at a 1/2 second interval to indicate that a scanning mode is active.

When a signal is received that exceeds the Squelch setting, Memory Channel scanning will pause for as long as a signal is received. After signal reception ceases, Scan Mode will hold the frequency for a few more seconds before scanning resumes. To force the radio to continue scanning while a frequency is being received, press either the **<** or **>** button to "nudge" it off the frequency currently being received.

When the scanning reaches Memory Channel 99 or Memory Channel 00, respectively, Memory Channel scanning will loop to the other end of the Memory Channels and continue scanning in the same direction.

Memory Channel Scanning will continue until stopped by:

- Pushing the CLR button
- Pushing PTT during the reception of a signal
- Pushing the Emergency button

Skipping Memory Channels During Scanning

Some frequencies - such as ATIS and AWOS - are broadcasted on continuously. While you may want to store these frequencies into Memory Channels for quick access to them, you may not want them to be received during a scan. To set a Memory Channel to be skipped (Skip Tag) while scanning:

- Select a Memory Channel as described in the Recalling Memory Channels section above.
- Push and hold MEM for one to two (1-2) seconds
- The lock icon wil flash continuously to indicate that this Memory Channel will be skipped during a scan.
- Repeat the above procedure to allow a skipped memory channel to be scanned again. The flashing lock icon will cease flashing.

Memory Banks

By default, all 100 Memory Channels are scanned at sequentially whenever Memory Channels are Scanned. However, you may prefer to break up your memory channels into banks so that only 10 of them are scanned at a time. This is useful for programming small groups of frequencies that you scan through at a particular location, such as at an airshow or at your favorite airports.

To turn Memory Banks on and off, see the Advanced Settings section of this manual.

When Memory Banks are enabled, only Memory Channel Scanning behavior is affected. All 100 Memory Channels can still be stored and accessed like normal. However, when a scan is initiated, only the Memory Channels that start with the same number are scanned. For example, if you start a scan from Memory Channel 34, only Memory Channels 30-39 are scanned. Similarly, if you start a scan from Memory Channel 03, only Memory Channels 00-09 are scanned.

This mode effectively divides up your Memory Channels into 10 scannable banks of 10 channels each.

Key Beep Volume Adjustment

To adjust key beep volume:

- Push and hold the SQL button until it says BEEPXX. XX represents the current key beep volume level. You will need to continue holding the SQL button as the radio passes through Sidetone Adjustment, which is displayed as "SideXX"
- Adjust key beep volume level by using the **<** and **>** buttons.
- The display will show 0 through 8; 0 is no key beeps (beeps are muted), 8 are loud key beeps
- To exit Key Beep Volume Adjustment push the SQL or CLR button

Advanced Settings

Option: Assume Leading 1 During Frequency entry: OFF (default) / ON

When this option is turned ON, the first "1" when entering frequencies is automatically typed. This is possible because all frequencies that can be tuned by the DX15 begin with "1".

To set:

- Turn power OFF.
- Push and hold the **1** button.
- Turn power ON.
- If message "1 - off" is displayed, this behavior is OFF
- If message "1 - on" is displayed, this behavior is ON
- The message will clear after two seconds and you can then use your DX15 normally.
- To change between modes, repeat the procedure (repeated cycles toggle between the two modes).

Example : If set to OFF (Factory Default), the following frequency entry method is used:

To set a frequency of 128.775, type the following:

1 2 8 7 7

The display should then read:

128.775

If set to ON, the following frequency entry method is used:

To set a frequency of 128.775, type the following:

2 8 7 7

The display should then read:

128.775

Option: Side buttons used for Direct Squelch: OFF (default) / ON

Lets the side **^** and **V** be used exclusively to set Squelch.

To set:

- Turn power OFF.
- Push and hold the SQL button.
- Turn power ON.
- If message "SQL off" is displayed, this behavior is OFF. When in modes such as Setting Squelch or Recalling Memory Channels that use the keypad **<** and **>** buttons, the side **^** and **V** buttons can also be used interchangably. The side **^** and **V** buttons are also used to enter and cycle through ten Most Recently Used frequencies - see the Recalling Recently Used frequencies section for details.
- If message "SQL on" is displayed, this behavior is ON. The side **^** and **V** buttons have a single use - to increase or decrease Squelch. In this mode, Squelch can easily be increased or decreased with single button pushes. However, when this mode is selected, the Most Recently Used frequencies can not be recalled.
- The message will clear after two seconds, followed by a beep, and you can then use your DX15 normally.
- To change between modes, repeat the procedure (repeated cycles toggle between the two modes).

Option: Backlight Behavior: ON (default) / 5-sec.

Sets the behavior of the backlight when keys are pressed.

To set:

- Turn power OFF.
- Push and hold the **LIGHT** button.
- Turn power ON.
- If message "L-On" is displayed, pushing LIGHT button causes backlighting to be on continuously until LIGHT button is pushed again.
- If message "L-5SEc" is displayed, pushing any button (except Push To Talk) will cause backlighting to come on temporarily for five (5) seconds. Pressing the LIGHT button will still cause the backlighting to be on continuously until the LIGHT button is pushed again.
- The message will clear after two seconds, followed by a beep, and you can then use your

DX15 normally.
- To change between modes, repeat the procedure (repeated cycles toggle between the two modes).

Option: Memory Banks Enabled: *OFF* (default) / ON

Toggles whether or not Memory Banks can be used. See section Memory Banks for details.

To set:

- Turn power OFF.
- Push and hold the **MEM** button.
- Turn power ON.
- If message "BANK-n" is displayed, this behavior is OFF.
- If message "BANK-Y" is displayed, this behavior is ON.
- The message will clear after two seconds, followed by a beep, and you can then use your DX15 normally.
- To change between modes, repeat the procedure (repeated cycles toggle between the two modes).

Option: Enable Transmit: OFF / ON (default)

Toggles whether or not the DX15 can transmit. Disabling the ability to transmit can be useful for users who do not wish to ever transmit on the airband by accidentally pushing the Push to Talk button.

To set:

- Turn power OFF.
- Push and hold the **v** button.
- Turn power ON.
- If message "tx OFF" is displayed, transmitting is disabled.
- If message "tx on" is displayed, transmitting is enabled.
- The message will clear after two seconds, followed by a beep, and you can then use your DX15 normally.
- To change between modes, repeat the procedure (repeated cycles toggle between the two modes).

Option: Stop Transmitting on Stuck Mic: OFF / ON (default)

Toggles an options that turns off the transmitter if a stuck mic is detected.

To set:

- Turn power OFF.
- Push and hold the **>** button.
- Turn power ON.
- If message "Stuc-Y" is displayed, transmitting ceases when a stuck mic is detected. The

mic is considered stuck open after 30 seconds of continuous transmitting. At this time, the DX15 will emit a beep, the display will momentarily show the transmit icon and the text "StucK". Transmitting will be re-enabled once the Push To Talk button is released and pressed again.

- If message "Stuc-n" is displayed, the radio will transmit as long as the Push To Talk button is held; Stuck mic detection is inhibited.
- The message will clear after two seconds, followed by a beep, and you can then use your DX15 normally.
- To change between modes, repeat the procedure (repeated cycles toggle between the two modes).

External Connections

External Power

! *Warning!*

Connecting your DX15 Handheld VHF Air Band Transceiver to voltage inputs *outside the range of 10 - 30V DC* **will damage** your DX15, requiring repair or replacement (not covered by warranty), and could result in other hazardous consequences such as fire. To prevent damage, only use battery chargers sold by Dynon Avionics as directed.

In situations where a cigarette lighter power outlet is available (10-30V DC), the (optional) Vehicle Power Adapter can be used to power and simultaneously charge your DX15.

To connect your DX15 to external power:

- Connect the (optional) Vehicle Power Adapter to the DC IN of your DX15 as illustrated (graphic of plug being inserted into DC In jack)
- Plug the charger into a cigarette lighter power outlet (10-30V DC) (graphic of cigarettle lighter plug)

Whenever your DX15 is connected to external power, it will charge the battery, even when your DX15 is being used to receive and transmit. During charging the Battery Status icon will animate to indicate it is charging. Additionally, the bars on the interior of the Battery Status icon will display the approximate state of the charge. When charging is complete, the Battery Status icon will be solid and the bars will extend through the entire length of the Battery Status icon.

A fully-discharged battery will require approximately X hours to fully recharge (4 hours was on the desk charger - need to verify this number on external power.)

Note: While your DX15 can be used to receive and/or transmit during charging, such usage during charging will increase the time it takes for the battery to fully recharge.

External Microphone / Speaker / Push To Talk

Connection to a headset, microphone, push-to-talk switch, etc. requires the optional 100844-000 Headphones / Push To Talk (PTT) Adapter Cable. This cable and its connectors are configured for headset connections common in aviation.

Note: when the 100844 Headphones / PTT Adapter Cable is plugged in, your DX15's built-in microphone and speaker is disabled.

Sidetone Adjustment

Sidetone is audio fed from the microphone to the headset. Sidetone helps you hear yourself speak when wearing a headset in a noisy environment like an airplane.

 To set sidetone:

- Push and hold the SQL button for 1-2 seconds
- Adjust sidetone level by using the **<** and **>** buttons
- The display will show 0 through 8; 0 is no sidetone, 8 is very loud sidetone
- To exit Sidetone Adjustment, push the SQL or CLR button

External Antenna

! *Warning!*

Dynon Avionics has not tested, nor does it recommend the use of any antenna other than the included 100993-000 Flexible Antenna.

Using your DX15 Handheld VHF Air Band Transceiver with an external antenna is done entirely at your risk of the following:

- Potential damage to your DX15
- Potential improper transmissions, such as interference
- Potential excessive exposure to Radio Frequency (RF) Electromagnetic Energy.

The xxxxxx-xxx External Antenna Adapter can be used to connect your DX15 to a 50-ohm external antenna using coaxial cable that terminates in a female BNC connector.

Note: If connecting your DX15 to externally-mounted aircraft antenna, insure that the antenna is properly tuned for the 118 - 136.975 MHz Aviation band.

Appendix A - Warranty

Limited Warranty

Dynon Avionics warrants this product to be free from defects in materials or workmanship for one (1) year from date of shipment. Dynon Avionics will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor. The customer is, however, responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, improper installation or unauthorized alteration or repairs.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE, AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY LIABILITY ARISING UNDER WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS,

WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL DYNON AVIONICS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Dynon Avionics retains the exclusive right to repair or replace the instrument or firmware or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

Dynon Avionics' products incorporate a variety of precise, calibrated electronics.

Except for replacing the battery pack and other external accessories, this device does not contain any field/user-servicable parts.

Units that have been found to have been taken apart may not be eligible for repair under warranty.

Appendix B - DX15 Specifications

All specifications are subject to change without notice or obligation.

Appendix C - Frequently Asked Questions (FAQs)

Q. Does the DX15 operate on Civil Air Patrol (CAP) frequencies (143.xx / 148.xx / 149.xx using FM)?

A. The DX15's operates only within the 118.000 - 136.975 MHz Air Band, using AM. CAP uses some frequencies within the Air Band - check with your local CAP Wing.

Q. Does the DX15 provide NAV functions?

A. The DX15 does not provide any NAV functions, including VOR or Duplex. The DX15 is a COMM radio only.

Q. Is there a computer program available for pre-setting frequencies using a computer?

A. There is no computer program is available for the DX15.

Q. What transmission / reception range can I expect from the DX15?

A. The DX15 is designed for short-range communication, primarily due to its flexible antenna and low power output. In the air, the DX15 could potentially communicate for many miles. When using the flexible antenna, hold the DX15 as high as possible, away from your body for maximum communication range. When used in an aircraft, using an external antenna (see the section External Connections and Appendix H: Optional Accessories, xxxxxx-xxx External Antenna Adapter for details) will extend the communications range of the DX15 considerably.

Appendix D - Troubleshooting

Problem Description	Possible Cause	Solution / Fault Isolation	Reference (in docs)
When turned on, nothing shows on the display	Battery is completely discharged	Charge the battery	
Battery life is too short	Backlight is on continuously	Use backlight only intermittantly	
Battery will not charge (Wall Power Adapter)	No power at wall outlet	Check that wall outlet is supplying power	
Battery will not charge (vehicle charger)	Fuse blown	Check the fuse in the body of the vehicle charger plug	
Nothing happens when front panel buttons are pushed	Lock Mode is enabled	Turn off Lock Mode	
Noise bursts are heard often	Squelch is too loose	Adjust squelch to a higher number	
Transmissions aren't being heard from the cockpit	Transmissions being blocked by fuselage	Use an external antenna	
When scanning, odd noises are heard on certain frequencies	Possibly receiving data communications	Instead of band scanning, scan specific channels	
Keep hearing loud tones	Sidetone is set incorrectly	Set sidetone correctly	
Display says ERR	Unknown condition	Perform factory reset procedure	

Appendix E - Requesting Support / Repair

Before contacting Dynon Avionics Technical Support, please consult Appendix 5 - Troubleshooting for common issues and solutions for details.

In rare circumstances, performing a Factory Reset may fix some issues - please consult Appendix G - Factory Reset / Defaults for for details.

Before contacting Dynon Technical Support, please have the following information ready:

- Please have your DX15 at hand; if possible have the Wall Power Adapter also at hand to provide power if there is a battery issue.
- Please be prepared to remove the battery to expose the information sticker with the unit's serial number).
- If possible, please perform the three procedures below to display your DX15's *electronic (internal)* software version, hardware version, and serial number:
    - Displaying your DX15's electronic *software* version*:*
        - Turn power OFF.
        - Push and hold the LOCK button.
        - Turn power ON.
        - After an r (lowercase R, no quotes) is displayed, release the LOCK button.
        - Push the **1** button.
        - The number displayed is your DX15's electronic *software* version.
        - Please write down this number for the Dynon Avionics Technician.
        - Turn power OFF.
    - Displaying your DX15's electronic *hardware* version:
        - Turn power OFF.
        - Push and hold the LOCK button.
        - Turn power ON.
        - After an r (lowercase R, no quotes) is displayed, release the LOCK button.
        - Push the **2** button.
        - The number displayed is your DX15's electronic *hardware* version.
        - Please write down this number for the Dynon Avionics Technician.
        - Turn power OFF.
    - Displaying your DX15's electronic electronic *serial number*:
        - Turn power OFF
        - Push and hold the LOCK button
        - Turn power ON
        - After an r (lowercase R, no quotes) is displayed, release the LOCK button
        - Push the **3** button
        - The number displayed is your DX15's electronic *serial number*.
        - Please write down this number for the Dynon Avionics Technician.

Dynon Avionics Technical Support contact options:

Phone: (425) 402-0433 - 7:00 AM - 5:00 PM (Pacific Time) Monday - Friday.
Fax: (425) 984-1751
email: support@dynonavionics.com
Web:

- docs.dynonavionics.com – Current and archival documentation
- downloads.dynonavionics.com – Software downloads
- support.dynonavionics.com – Support resources
- store.dynonavionics.com – Dynon's secure online store for purchasing all Dynon products 24 hours a day.
- wiki.dynonavionics.com – Dynon Avionics' Documentation Wiki provides enhanced,

extended, continuously-updated online documentation contributed by Dynon employees and customers.

- forum.dynonavionics.com – Dynon Avionics' Internet forum where Dynon customers can interact and receive Dynon technical support outside of telephone support hours. A key feature of the forum is that it allows the exchange of diagrams, photos, and other types of files.

Appendix G - Factory / Reset Defaults

In rare circumstances, a Factory Reset may fix some problems with your DX15.

! *Warning!*

Performing a Factory Reset will delete all of your settings, including *all* (as many as 100!) memory channels that you have programmed.
There is no way to save or preserve memory channels in the process of performing a Factory Reset.
If you wish to restore your memory channels, please verify each memory channel's setting and record them for later re-programming.

When performing a Factory Reset, the following settings will be changed to factory defaults:

(Some of these settings are explained in detail in section Advanced settings.)

- Current frequency is set to: **118.000 MHz**
- Memory Channels: **Not Programmed**
- Quick Recall Memories: **Not Programmed**
- Squelch: **XX**
- Sidetone: **0**
- Auto-entry of leading 1 (100 MHz) during frequency entry: **OFF**
- Side buttons function: **UP/DOWN**
- Backlight button behavior: **Turns on backlighting continuously**
- Tones on button push: **OFF**
- Memory banks: **DISABLED**
-

Factory Reset Procedure

1. Turn power OFF.
2. Push and hold the LOCK button.
3. Turn power ON.
4. After an r (lowercase R, no quotes) is displayed, release the LOCK button.
5. *Last chance to reconsider... remember - all memory channels and other personalized settings will be erased...*
6. Push and hold the CLR button for at least one (1) second
7. After approx. one (1) second, all of the display's icons and digits will be displayed
8. Your DX15 is now reset to factory defaults as discussed above.
9. Turn power OFF.

Appendix H - Accessories

All included accessories may also be purchased separately; for example, purchasing a second battery. For current pricing and availablility, see store.dynonavionics.com

Included:

- 100993-000 Flexible Antenna
- 100965-000 7.4V 1.3Ah Lithium-Ion Battery With Belt Clip
- xxxxxx-xxx Lanyard
- 100846-000 Wall Power Adapter
- 101219-000 DX15 Operation Manual
- xxxxxx-xxx Warranty Card

Optional Accessories:

- 100845-000 Vehicle Power Adapter
- xxxxxx-xxx Desktop Rapid Charger, consisting of:
  - 100997-000 Desktop Rapid Charger Base
  - 100997-001 Desktop Rapid Charger Wall Power Adapter
- 100844-000 Headphones / Push To Talk (PTT) Adapter Cable
- xxxxxx-xxx External Antenna Adapter

Accessory availability and specifications are subject to change without notice or obligation.

Appendix I - Using the (optional) Desktop Rapid Charger

Note: The Desktop Rapid Charger consists of:

- 100997-000 Desktop Rapid Charger Base
- 100997-001 Desktop Rapid Charger Power Adapter.

The Desktop Rapid Charger is a quicker and more convenient way to recharge your DX15, and also to charge spare batteries without requiring the presence of your DX15.

To charge your DX15 in the Desktop Rapid Charger, carefully insert your DX15 as illustrated. (graphic of **DX15** being inserted into the base)

To charge spare batteries in the Desktop Rapid Charger, carefully insert the battery as illustrated. (graphic of **battery** being inserted into the base).

When a DX15 or battery has been inserted into the Desktop Rapid Charger, the charger's indicator will glow Red. When charging is complete, the indicator will change color to Green.

Note: Unlike with the use of the Wall Power Adapter and (optional) Vehicle Power Adapter, when your DX15 is being charged in the Desktop Rapid Charger, *the display will not provide any indication of charging status*.

A fully discharged battery will require approximately 4.5 hours to recharge using the Desktop Rapid Charger.

Note: While your DX15 can be used to receive and/or transmit during charging, such usage during charging will increase the time it takes for the battery to fully recharge.

If you are using your DX15 as a backup trasceiver that will be stored without being used for long periods, the battery will hold its charge longest if it is disconnected from the radio. Store the battery so that its electrical contacts are not able to be shorted by surrounding metal objects. Charge your battery every xxx months to keep it fully charged should it be needed in an emergency.

Note: Unlike older battery technologies, Lithium-Ion batteries do not suffer adverse affects if they are not fully charged or discharged. As with all rechargable batteries, the usable capacity of your DX15's battery will decrease with time and usage. Replacement batteries can be obtained from Dynon Avionics and authorized dealers.

Appendix J - Using the (optional) Vehicle Power Adapter

In situations where a cigarette lighter power outlet is available (10-30V DC), the (optional) Vehicle Power Adapter can be used to power and simultaneously charge your DX15.

⚠ *Warning!*

Connecting your DX15 Handheld VHF Air Band Transceiver to voltage inputs *outside the range of 10 - 30V DC* **will damage** your DX15, requiring repair or replacement (not covered by warranty), and possibly cause other hazardous consequences. When in doubt, test the outlet with a Multimeter / Volt-Ohm Meter to insure proper voltage.

To connect your DX15 to the Vehicle Power Adapter:

- Connect the radio power connector to the DX15's DC IN as illustrated (graphic of plug being inserted into DC In jack)
- Plug the cigarette lighter plug into a cigarette lighter power outlet (graphic of cigarettle lighter plug)

Whenever your DX15 is connected to external power, it will charge the battery, even when your DX15 is being used to receive and transmit. During charging the Battery Status icon will flash on and off to indicate that it is charging. Additionally, the bars on the interior of the Battery Status icon will display the approximate state of the charge. When charging is complete, the Battery Status icon be on solid and the bars will extend through the entire length of the Battery Status icon.

A fully-discharged battery will require approximately xxx hours to fully recharge via the DC IN.

Note: While your DX15 can be used to receive and/or transmit during charging, such usage during charging will increase the time it takes for the battery to fully recharge.

If you are using your DX15 as a backup trasceiver that will be stored without being used for long periods, the battery will hold its charge longest if it is disconnected from the radio. Store the battery so that its electrical contacts are not able to be shorted by surrounding metal objects. Charge your battery every xxx months to keep it fully charged should it be needed in an emergency.

Note: Unlike older battery technologies, Lithium-Ion batteries do not suffer adverse affects if they are not fully charged or discharged. As with all rechargable batteries, the usable capacity of your DX15's battery will decrease with time and usage. Replacement batteries can be obtained from Dynon Avionics and authorized dealers.

Changing the Fuse In the Vehicle Power Adapter

Diagram - Exploded view of the cigarette lighter plug 4 pieces

The 100845-000 Vehicle Power Adapter includes a fuse to protect your DX15 from excessive voltage. The fuse can be replaced with a fuse meeting the following specifications:

- Glass tube / barrel type
- 0.25 inches (6.3mm) x 1.25 inches (32mm)
- 2A, 250V
- Fast-acting

To reassemble the Vehicle Power Adapter, insert the four (4) pieces into the cavity at the tip of the Adapter, in the following order:

1. Spring
2. Fuse
3. Screw the knurled nut (with the tip inserted)
4. Hand-tighten the knurled nut until snug

Unresolved Manual Questions / Issues:

- Diagrams?
- Voltage input of the Wall Power Adapter
- Voltage input of the Desktop Rapid Charger
- Do not operate this device below xx°F (-xx°C) or above xx°F (xx°C).
- Charge your battery every xxx months to keep it fully charged should it be needed in an emergency. (2 places)
- xxxxxx-xxx Lanyard (2 places)
- xxxxxx-xxx DX15 Registration Card
- xxxxxx-xxx External Antenna Adapter (3 places)
- x.x pounds / x.x Kg (includes Dynon 100965-000 7.4V 1.3Ah Lithium-Ion Battery With Belt Clip, 100993-000 Flexible Antenna)
- Operating: -xx°F / -xx°C to +xx°F / +xx°C
- Storage: -xx°F / -xx°C to +xx°F / +xx°C
- Endurance (10% duty cycle): x.xh
- Endurance (25% duty cycle): x.xh
- Endurance (50% duty cycle): x.xh
- Recharge (completely discharged) - (optional) Desktop Rapid Charger: approx. 4.5h (sks brief test - discharged battery on drop in charger took approx. 4.5 hours to recharge)
- Recharge (completely discharged) - Wall Power Adapter / (optional) Vehicle Power Adapter: x.xH
- 1.5 watts PEP

- +/- 2 ppm
- xxxxxx-xxx Desktop Rapid Charger, consisting of:
    - 100997-000 Desktop Rapid Charger Base
    - 100997-001 Desktop Rapid Charger Wall Power Adapter
- A fully-discharged battery will require approximately xxx hours to fully recharge via the DC IN. (2 places)