May 31, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-1

8.04 MHz Clock on Controller Board Will Not Oscillate

+ + + + Information not yet available + + + +

May 31, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-2

D654 Destroyed When a Linear is Connected

+ + + + Information not yet available + + + +

June 1, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-3

Blue Book Correction - Alignment

+ + + + Information not yet available + + + +

June 13, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-4

Receiver IF Breaks Into Oscillation After Transmission

+ + + + Information not yet available + + + +

June 13, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-5

Low or No Output From RF Board

+ + + + Information not yet available + + + +

June 13, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-6

S-Meter Rises Over Half Scale When IF Shift Control Is Rotated

+ + + + Information not yet available + + + +

June 17, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-7

Blue Book Schematic Correction

+ + + + Information not yet available + + + +

June 17, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-8

Blue Book Corrections

+ + + + Information not yet available + + + +

July 25, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-9

RF Circuit Board Schematic Correction

+ + + + Information not yet available + + + +

August 29, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-10

Blue Book Audio Circuit Board Schematic Correction
C915

+ + + + Information not yet available + + + +

October 31, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-11

Blue Book Corrections - Power Amplifier Schematic

+ + + + Information not yet available + + + +

November 30, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-12

Distortion In Audio

+ + + + Information not yet available + + + +

December 19, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-13

Output Signal Distorted

+ + + + Information not yet available + + + +

December 19, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-14

Low Transmitter IF Signal to IF Amplifier

+ + + + Information not yet available + + + +

December 19, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-15

IF Amplifier Breaking into Oscillation

+ + + + Information not yet available + + + +

December 19, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-16

Dynamic Range of Audio Amplifier Compressed

+ + + + Information not yet available + + + +

December 19, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-17

BFO Drifting

+ + + + Information not yet available + + + +

December 19, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-18

Narrow CW Transmit Offset

+ + + + Information not yet available + + + +

December 19, 1983

HW-5400 Bulletin
No:
HF Transceiver HW-5400-19

Low Output from High VCO

+ + + + Information not yet available + + + +

February 29, 1984

HW-5400 Bulletin
No:
HF Transceiver HW-5400-20

BFO And RIT Oscillators Have Insufficient Range;
RF and IF Performance Improvements

The following changes give greater tuning range to the BFO and RIT oscillator circuits and improve performance of the RF and IF stages.

BFO Circuit

BFO Circuit Board:

Change C811 to 220 pF capacitor [PN 20-120]. This capacitor may have been changed to a 180 pF [PN 21-746] per Bulletin HW-5400-17, or it may still be the original 120 pF [PN20-183].

RIT Circuit

IF Circuit Board:

Change R1145 from 1800 ohms to 2200 ohms [PN 6-222-12].
Change R1151 from 1000 ohms to 1500 ohms [PN 6-152-12].

Controller circuit board:

Change C703 and C704 from 330 pF to 220 pF [PN 20-120].
Change C720 back to a 3.2 - 18 pF [PN 31-71] if it has
been previously changed, per Bulletin HW-5400-18.

RF Circuits

RF circuit board:

Install a ferrite bead [PN 475-16] on the base lead of
Q401 and Q402.

IF circuit board:

Install a ferrite bead [PN 475-16] on the base lead of
Q1104 and Q1105.

PA circuit board:

Install a .01 uF capacitor [PN 21-176] between ground and
the lead of R1207 nearest T1202.

March 9, 1984

HW-5400
HF SSB Transceiver

Bulletin No:
HW-5400-21

Modification Summary

Below is a summary of all HW-5400 modifications, with applicable Bulletin Nbrs. They should be installed in each unit serviced; however, some may already be present.

Audio Circuit Board

-- C908, remove and replace with a jumper wire. [HW-5400-12]
-- C915, remove and discard. [HW-5400-16]
-- C929, change from .1 uF to 330 pF [PN 21-722]. [HW-5400-14]
-- R913, change from 33 Kohms to 68 Kohms [PN 6-683-12]
[HW-5400-16]

High VCO Assembly

-- R367, change from 100 to 33 ohms [PN 6-330-12]. [HW-5400-19]

BFO Circuit Board

-- C811, change from 120 pF to 220 pF [PN 20-120]. [HW-5400-20]
-- C817, change from 7.7 pF to 27 pF [PN 21-6]. [HW-5400-17]
-- C819, change from 160 pF to .01 uF [PN 21-761]. [HW-5400-17]
-- C821, change from 7.7 pF to 27 pF [PN 21-6]. [HW-5400-17
-- L804, change from 22 uH toroid to 10 uH toroid [PN 45-57].
[HW-5400-17]

ALC Circuit Board

-- D654, change from a 1N5234B [PN 56-58] to a 1N4751 [PN 56-64].
[HW-5400-2]

Controller Circuit Board

-- C702, should remain the original value [3.2-18 pF] [PN 31-71].
   If it was replaced per Bulletin HW-5400-18, reinstall a [PN 31-71].
-- C703, change from 330 pF to 220 pF [PN 20-120]. [HW-5400-20]
-- C704, change from 330 pF to 220 pF [PN 20-120], [HW-5400-20]
-- C701, add a second diode [PN 56-648] * in parallel [piggyback].
    [HW-5400-18]
-- Q701, change from a MPS6521 to a 2N2369 [PN 417-154].
    [HW-5400-1]
-- Q702, change from a MPS6521 to a 2N2369 [PN 417-154].
    [HW-5400-1]

IF Circuit Board

-- R1145, change from 1800 ohms to 2200 ohms [PN 6-222-12].
    [HW-5400-20]
-- R1151, change from 1000 ohms to 1500 ohms [PN 6-152-12].
    [HW-5400-20]
-- Q1104, install a ferrite bead [PN 475-16] on the base lead.
    [HW-5400-20]
-- Q1105, install a ferrite bead [PN 475-16] on the base lead.
    [HW-5400-20]

Power Amplifier Circuit Board

-- C1206, install a .01 uF capacitor [PN 21-176] between ground
   and the lead of R1207 nearest transformer T1202. [HW-5400-20]

RF Circuit Board

-- Q401, install a ferrite bead [PN 475-16] on the base lead.
    [HW-5400-20]
-- Q402, install a ferrite bead [PN 475-16] on the base lead.
    [HW-5400-20]

May 31, 1984

HW-5400 — Bulletin No:
HF SSB Transceiver — HW-5400-22

Blue Book Correction
Dual Banana Plug Part Numbers

In the HW-5400 Service Data manual [Blue Book], pages 166 and 169, change the part number of the dual-banana plug from 438-47 to 438-30.

July 30, 1984

HW-5400 — Bulletin No:
HF SSB Transceiver — HW-5400-23

Wrong Size Pressed-in Spacers On Chassis

Some chassis for this unit have incorrect size pressed-in spacers installed. The incorrect size spacers are 1/8" too short and are the wrong thread size; 4-40 instead of 6-32. However, most of the chassis have the correct size spacers and those chassis which have incorrect size spacers, only two or three spacers may be the wrong size.

The pressed-in spacers are used, in most cases, to mount a circuit board onto the chassis. If the incorrect size spacers are tight in the chassis, you may secure the circuit board at these spacers by installing the following hardware.

-- Refer to the drawing at the right and install a 4-40 x 3/4"
   screw [PN250-312] from the opposite side of chassis through the
   spacer. Tighten this screw into the spacer.

-- Install a 4-40 nut [PN 252-2] on the end of the 4-4 x 3/4"
   screw and tighten it down onto the spacer.

-- Mount the circuit board with another 4-40 nut [PN 252-2].

Install this hardware as needed.

August 10, 1984

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-24

PN 56-648 Diode No Longer Available

The MV109 varator diodes at D101, D301, D351, D701 and D701b are changed:

From PN 56-648 to 56-674.

This new diode is an MV209 and has a different case style. Install it as at the right. [[Note: shows mounting the flat side with pc board marked 'band']]. Use this new diode when a replacement is needed.

August 10, 1984

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-25

Output On 30 And 40 Meters Too High

To reduce the output on the 30 meter and 40 meter bands, install a trap on the RF circuit board.

Parts Needed

Qty	Description	Heath PN
1	470 ohm resistor	6-471-12
1	15 pF ceramic capacitor	21-707
1	22 uH choke	45-631

Installation

-- Connect the 470 ohm resistor, the 15 pF capacitor and the 22uH choke in series as shown at the right. [[Shows one end of 22uH choke mounted vertically into hole marked 'A' , the 15pF capacitor soldered to the free end of the choke. The other end of the cap soldered to the 470 ohm resistor, which in turn is mounted vertically into hole on PCB marked 'B'.]]

-- On the RF board, install the RLC network [[Above]] in the two unused circuit board holes near D404. These holes are marker A and B on the x-ray view at the right. Install the choke in hole A.

August 17, 1984

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-26

Improved CW Keying

On the RF circuit board, make the following circuit changes.

Parts needed

QTY	Description	Heath PN
2	1200 ohm resistor	6-122-12
1	Diode	56-56
1	10 uF capacitor	25-864
1	.68 uF capacitor	25-922

Procedure

-- On the RF circuit board, remove the 2200 ohm resistor at R415.

-- Remove the 10 uF capacitor at C424.

-- Change the 4.7 uF electrolytic capacitor at C418 to a .68 uF electrolytic capacitor [PN 25-922]

-- Refer to the drawing at the right and connect the two 1200 ohm resistors [PN 6-122-12] and the [PN 56-56] in series. The banded end of the diode connects to the end of a 1200 ohm resistor. [[[diode - resistor - resistor]]]

-- Install the resistor - diode combination at R415 on the board. The free end of the 1200 ohm resistor connects to the base of Q403. The anode of the diode connects to the collector of Q412.

-- Connect the 10 uF capacitor [PN 25-864] from the junction of the 1200 ohm resistors to the ground end of R414.

Install these changes only when needed.

August 24, 1984

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-27

Unable To Adjust R803 FOr 8.8307 Mhz

On the BFO board, you may find that when you adjust R837 fully clockwise, the 8.8307 Mhz frequency is still 100 to 200 Hz too high. In this case, change:

R841 from a 47 kilohm resistor to a 10 kilohm resistor [PN6-103-12].

After this resistor change is made, repeat the BFO alignment from the beginning.

Make this change only when needed.

September 21, 1984

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-28

Color Dot Missing On Band Switch SW401A/B/C

In Factory Service, some of the wafer switches [PN 63-1386] at SW401A/B/C were found installed backwards because the color dot used as an orientation mark on each switch was missing.

To correctly install a switch with no color dot, use the circled number as the orientation mark. This circled number is on the same side of the switch as the color dot would normally be.

January 31, 1985

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-29

Intermittent Lockout Of PLL

The [PN 52-193] transformers used at T101, T102, T103 and T104 do not have enough adjustment range to enable absolute peaking of the RF level specified in the synthersizer alignment instructions. Some of these transformer's cores will be all the way up or all the way down and do not reach the peaking point. Since the RF levels are not peaked, this may cause intermittent PLL problems.

If the unit you're servicing has an intermittent PLL problem, change:

T101, T102, T103 and T104 from a [PN 52-193] transformer to a [PN52-182] transformer.

Change these transformers only when needed.

Future HW-5400 Transceiver kits will have the [PN 52-182] transformers.
T105 will remain a [PN 52-193] transformer.

January 31, 1985

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-30

IF Oscillation

On the IF board, IF oscillation problems are being created by the [PN 417-172] transistors used Q1104, Q1105 and Q1106. Each transistor causes particular symptoms when it oscillates. The symptoms are:

Q1104 - Causes upscale meter deflections.

Q1105 - Meter jumps full scale in the transition period between transmit and receive. Also, the AGC is too slow.

Q1106 - Meter jumps upscale when temperature varies slightly.

To correct, change:

Q1104, Q1105 and Q1106 from [PN 417-172] transistors to [PN417-293] transistors.

Install these transistors in the units received for service.

January 31, 1985

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-31

Won't Meet Overall Receiver Gain Specs

On the audio board, the previous change of R994 and R995 from a 1000 ohm resistor to a 47 ohm resistor decreased the audio gain, and now the Transceiver will not meet overall receiver gain specs. To ensure the Transceiver meets specs, change:

R994 and R995 from a 47 ohm resistor to a 1000 ohm resistor [PN 6-102-12].

Install the 1000 ohm resistors in all units received for service.

The bulletin supercedes HW-5400-15 in the 1983 book.

March 15, 1985

HW-5400 Bulletin No:
HF SSB Transceiver HW-5400-32

Screws Break Off In Pressed-in Spacers On Chassis

On the main and rear chassis, screws may bind in the pressed-in spacers, causing the screw to break. This problem has occurred only on the copper-colored chassis. To correct the problem, drill out the broken screw. If the spacer with the broken screw is used to mount a circuit board, remove all the board-mounting hardware and move the board aside. Drill out the broken screw from the bottom side of the spacer. Select a drill bit that fits inside the spacer so that you don't drill the hole too large to retap for a 6-32 machine screw. As you drill out the screw, be sure to keep the metal particles out of the unit. Retap with a 6-32 tap.

An insert [PN 591-4676] with two self-tapping screws attached is being put into the present stock of kits. The customer is instructed to use the self-tapping screws to retap all threaded studs before starting chassis assembly. Future production of kits will have a chassis with properly threaded spacers.

March 22, 1985

HW-5400 — Bulletin No:
HF SSB Transceiver — HW-5400-33

Transmitter Self-Oscillates In Tune Mode With CW Gain Control FCCW

On the IF board, install a 4700 ohm resistor [PN 6-472-12] from the base of Q1102 to ground. This can be done on the top of the board by connecting one resistor lead to the base at R1107 and the other lead to the grounded end of R1103.

This additional 4700 ohm resistor ensures that Q1101 and Q1102 turn off completely during transmit.

March 22, 1985

HW-5400 — Bulletin No:
HF SSB Transceiver — HW-5400-34

Little Or No ALC Cutback In Transmit Power When Operating Into 3 To 1 Impedance Mismatch [150 Ohm Load]

The ALC cutback operation is tested by connecting the transmitter to a 150 ohm load. The 3 to 1 mismatch should cause the ALC circuitry to reduce the transmitter output power about 30%. To improve the ALC cutback with high mismatches, on the ALC board:

Remove the 27 kilohm resistor at R659.

May 31, 1985

HW-5400 — Bulletin No:
HF SSB Transceiver — HW-5400-35

Diode Change At D903 And D904

On the audio board, the [PN 56-656] diodes at D903 and D904 are changed to [PN 56-56] diodes. The #56-656 diodes are obsolete.

May 31, 1985

HW-5400 — Bulletin No:
HF SSB Transceiver — HW-5400-36

Schematic Correction - Blue Book

On the BFO schematic in the HW-5400 Blue Book, P801-2 should go to P106-1. P802-2 should go to P905-9. Mark this correction on your yellow schematic.

May 31, 1989

HW-5400 — Bulletin No:
HF SSB Transceiver — HW-5400-37

1983 TEB Book Correction

In the 1983 TEB book, TEB HW-5400-6, page 143, last paragraph, change "P918" to read "P905, pin 4".

That's all I have listed for the HW-5400 (1983-89). Enjoy!

73 de Joe W7LPF/4 [NNN0KUU]