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Modifications for the Kenwood TH-28

Secret function manual of the KENWOOD TH-28e/48e

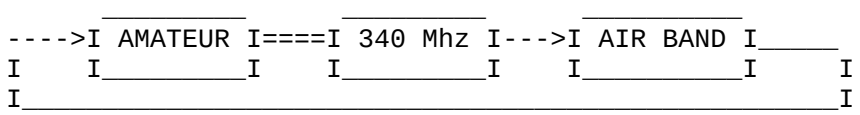
TH-28e/48e RX EXPANSION (ON)

Press PTT + VFO, then POWER ON.
New RX ranges TH28e after this modification:
VHF Band 136 - 174 Mhz (FM)
UHF Band 400 - 520 Mhz (FM)

TH48e:
UHF Band 400 - 470 Mhz (FM)
VHF Band 136 - 174 Mhz (FM)

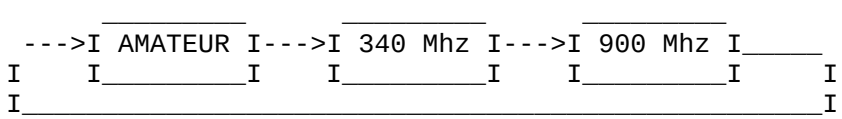
TH28e Air Band Expansion

Press F key for 1 sec. Then press LOW key.
New RX ranges
108 - 118 Mhz (FM)
118 - 136 Mhz (AM)
TH28e 340 - 400 Mhz Expansion
Remove the diode D8 from the control unit. (FM mode only) With Air Band and 340 Mhz expansion, operating band can be changed:



TH48e 340 MHZ & 900 MHZ EXPANSION

Remove the diode D8 from the control unit to cover 340 - 400 Mhz and 800 - 950 Mhz FM mode.



TH-28e/48e TX EXPANSION

Remove the diode D10 from the control unit.
New TX ranges after this modification:

TH28e:
VHF Band 136.000 - 174.250 Mhz (FM)
TH48e:
UHF Band 400.000 - 470.000 Mhz (FM)

Note:
Manufacturer guarantees TX/RX specification only in amateur band. The above frequency range is for the

microprocessor's range so that the receiver sensitivity or TX output power of expanded band may be reduced.

TH-48E TX/RX 432-438 Mhz LIMITED RANGE

Remove the diode D14 from the control unit.

TH28e/48e CROSS BAND REPEATER

Remove the diode D4 then press F key for 1 sec. and press 0 key.

TH-28a/e-48a/e FREQUENCY EXTENSION

Open the case and remove or add the destination chip diode D10, D11, D14 and D15 on the component side of the control unit.
(X53-340X-XX, X53-341X-XX)
The frequncy can then be extended as shown in the table 1 an 2 on page 3 and 4.(See the destination chip diode position drawing on the attached sheet.)

Notes:
The frequency display range may differ from the PLL lock range.

	360-Mhz band	Air band
Step	5,10,15,20,12.5,25 Khz	5,10,15,20,12.5,25 Khz
Frequency range	340.000-399.987.5 Mhz FM	100.000 - 117.975 Mhz FM 118.000 - 135.995 Mhz AM
Initial frequency	340.000 Mhz	118.000 Mhz

Initial step value is 12.5 Khz for 360-Mhz band and 25 Khz for Air band.
TH-48a/e BAND EXTENSION

The 360 Mhz band and the 800 Mhz band can be received. To expand the 360-Mhz band and the 800-Mhz band remove chip diode D8 of the control unit as shown in table 2.
You can switch between the UHF amateur band the 360-Mhz band and the 800-Mhz band by pressing the [F] key for 1 sec. and then the [LOW] key.

	360-Mhz band	800-Mhz band
Step	5,10,15,20,12.5,25 Khz	12.5,25 Khz
Frequency range	340.000-399.987.5 Mhz FM	800.000-949.987.5 Mhz FM
Initial frequency	340.000 Mhz	850.000 Mhz

Note:
Program scan is not possible over several bands, but is possible within each band.
Initial step value is 12.5 Khz.

Table 1 TH28a/e

Destination bit					Dest	Guaranteed	TX (Mhz)		RX (Mhz)	
B4	B3	B2	B1	B0		Min	Max	Min	Max	Min	Max
O	O	O	X	O	E2	144	146	136	174	136	174
O	O	O	X	X	E2	144	146	136	174	136	174
O	X	O	X	O	M2	144	148	136	174	136	174
O	X	O	X	X	M2	144	148	136	174	136	174
X	O	O	X	O	X2	144	148	136	174	136	174
X	O	O	X	X	X2	144	148	136	174	136	174
X	O	X	X	O	K2	144	148	142	152	136	174
X	O	X	X	X	K2	144	148	142	152	136	174

D15 D11 D14 D10 D8
O = Jumpered X = No jumper

Reset freq-	Offset freq-	Shift freq-	Auto shift	1750 tone	Air band	360 band	Sub-UHF RX (Mhz)	
							Min	Max
144	0.6	12.5	O	O	O	O	400	520
144	0.6	12.5	O	O	O	O	400	520
144	0.6	12.5			O		400	520
144	0.6	12.5			O	O	400	520
144	0.6	5	O		O		400	520
144	0.6	5	O		O	O	400	520
144	0.6	5	O		O		438	450
144	0.6	5	O		O	O	400	520

Sub-UHF	
Reset	Step

freq.	freq.
430	25
430	25
400	25
400	25

430	25
430	25
440	25
440	25

Table 2 TH48a/e

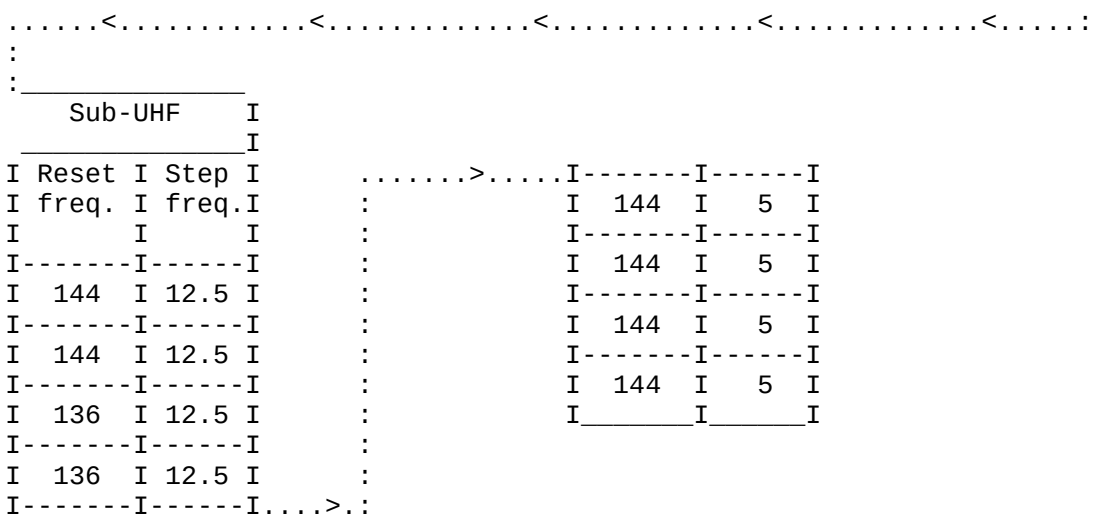
Destination bit					Dest	Guaranteed		TX (Mhz)		RX (Mhz)	
B4	B3	B2	B1	B0		Min	Max	Min	Max	Min	Max
O	O	X	O	O	E3	430	440	400	470	400	470
O	O	X	O	X	E3	430	440	400	470	400	470
O	X	O	X	O	M2	430	440	400	470	400	470
O	X	O	X	X	M2	430	440	400	470	400	470
X	O	O	X	O	X2	430	440	400	470	400	470
X	O	O	X	X	X2	430	440	400	470	400	470
X	O	X	X	O	K2	438	450	400	470	400	470
X	O	X	X	X	K2	438	450	400	470	400	470

D15 D11 D14 D10 D8

O = Jumpered X = No jumper

							Sub-VHF	
Reset freq-	Offset freq-	Shift freq-	Auto shift	1750 tone	360 band	800 band	RX (Mhz)	
							Min	Max
430	*	25		O			136	174
430	*	25		O	O	O	136	174
430	5	25					136	174
430	5	25			O	O	136	174
430	5	25					136	174
430	5	25			O	O	136	174
440	5	25					136	174
440	5	25			O	O	136	174

* = 1.6M, -7.6M



CLONING BY RADIO

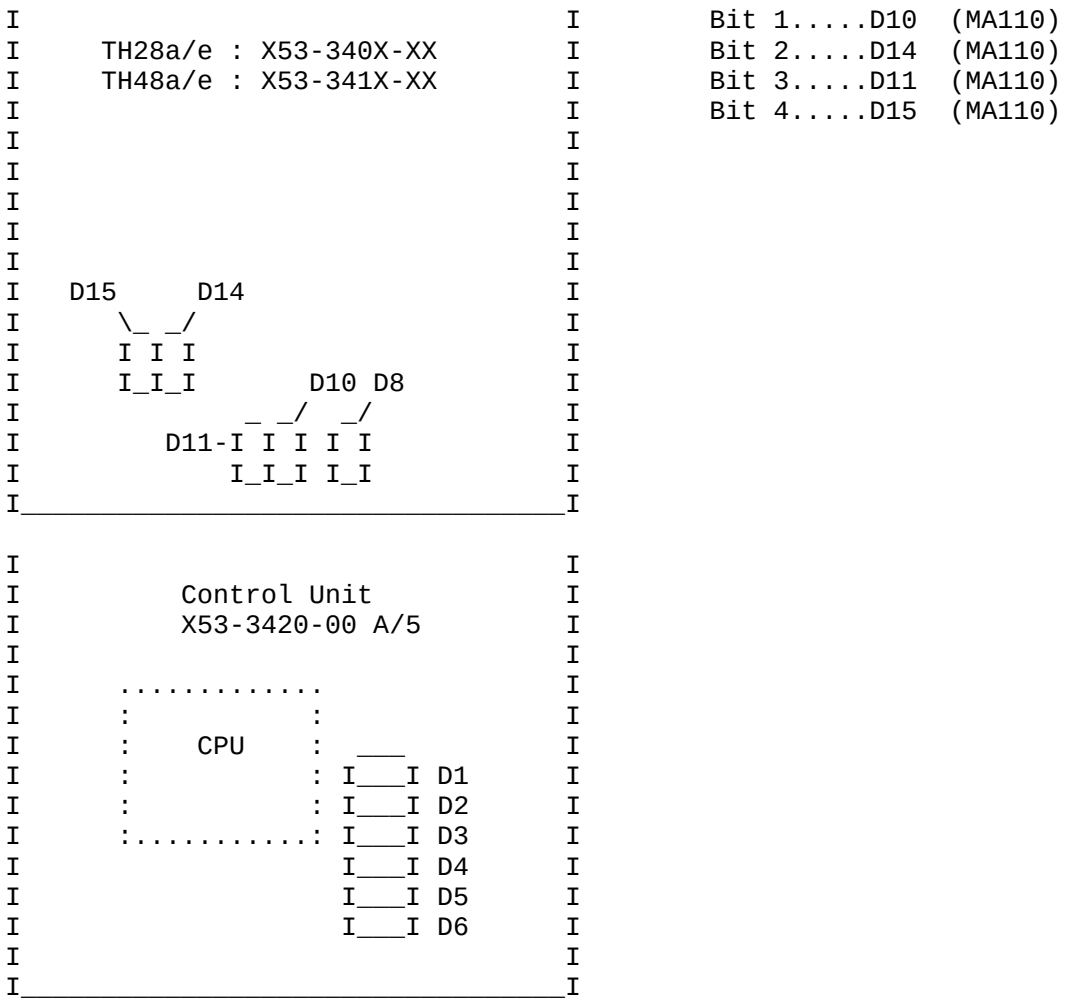
1. Overview of the clone function. (The function does not require frequency expansion.)
   Since 240 channels are available if an option is installed, it is laborious to write the same memory channel frequency data into several transceivers. Once you write data into one transceiver, you can duplicate it in several others in a single operation with the clone function. (You can write data without installing an option.)
2. How to use the clone function.

   Transmitter setup:
   1. Write the required memory channel frequency data into the transceiver.
   2. Set the transmit frequency.
   3. Switch the power off, hold down the 7 key on an F series tranceiver or the MR and PTT keys on a K series, and switch the power on again.

   "CLONE" appears on the display.
   (The transmit output is automatically set to "economic low".)

   Receiver setup:
   4. Set the frequency of the transceiver to the transmit frequency of the transmitter.
   5. Switch the power off, hold down the 7 key on an F series transceiver or the MR and PTT keys on a K series one, and switch the power on again.

   "CLONE" appears on the display.
   Press the PTT key on the transmitter. The clone function works automatically. When cloning ends, the frequency is displayed again.
   It takes about four minutes to transfer frequency data for 40 channels, and about nine minutes to transfer frequency data for 240 channels.
   If the receiver is an F series one and the frequency is displayed again, switch the power off, hold down the F key, and switch the power on again (VFO reset). If the receiver is a K series one and the frequency is displayed again, switch the power off and on again.
   Thus, cloning lets you copy the channel data stored in the transmitter to other transceivers in a single operation. To stop cloning, switch the power off and on again.



TH28 Send memory to other radio

To transfer memories from one radio to another,you can clone two TH-28a's.
Each radio must either have the ME-1 installed or no ME-1 installed,but they both must be the same!

Radio A will be the radio that SENDS the memories!
Radio B will receive the memories!

1. Turn on Radio B and enter say 144MHZ into all the memories you are going to CLONE TO.
2. Say radio A has 125 memories,enter 144MHZ into 125 of radio B's memories. This ENABLES or turns ON radio B's memories.
3. Turn both radios off then on.
4. Enter a simplex frequency into both radios and make sure you use the VFO mode.
5. Turn on radio A while pushing button 7 at the same time,the display should read"CLONE".
6. Turn on radio B while pushing button 7 at the same time,the display should read"CLONE".
7. Press PTT or push-to-talk on radio A!
8. You will hear tones on both radios which go real fast and vary in pitch.
9. Leave the radios for about 15-20 minutes so they can finish.
10. The tones will be repititous-this will indicate the transfer was successful.
11. Turn off radio A,you might hafto disconnect the battery.

12.Turn off radio B,then check the memories.

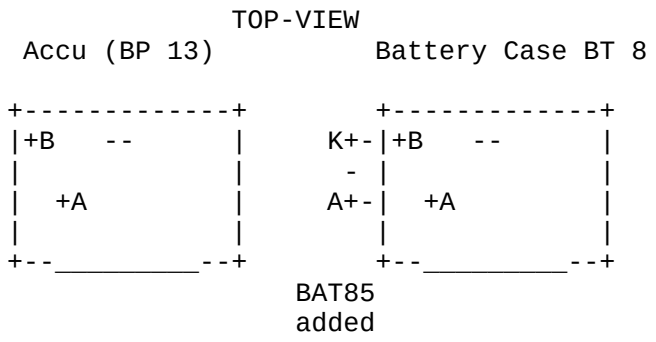
This does work,I tried it myself 125 memory transfer in 15 minutes PL's,odd offsets and all.Call channel is not transferred!If this does not work,try a few times.
Special thanks to N2OUM and N2PPT!
73 DE N2PPV

Accus in BT8 (TH28/48/78)

Hallo (X)YLs, OMs and Kenwood TH 28-owners

It is possible to use your Kenwood TH 28 (but I think also in a similar modification your TH 48 or TH 78) with the Battery-Case BT8 and NiCd-Accus. But how can you charge them ?
** The proposal here worked fine with my equipment, but if you do not have proper tools, soldering-eqipment and skill, pse do not try this modification! I don't give any waranty and you perform this modification on your own risk and responsibility.
But nevertheless vy 55 ! **

If you look on the top-side of the BT8-case and the original BP13- accu you'll see the following (not to scale !)



(+--_____--+ means the side of BP13/BT8 with the fixture-clamp)

+B means the battery-plus, +A the accu-plus
-- is the common grond (accu- and battery minus.)

DC-voltage is supplied to the DC-in jack of the TH28 and by this the +A gives the charging-current for the BP13 via an internal current-source

For charging NiCd-accus in the BT8 you only have to add a diode between +A an +B.
I used a Schottky-Diode BAT 85 (30V/200 mA) which has a lower flow-voltage than a silicium-diode, which will also work. (Anode to +A and Cathode to +B, so the charge-current will also go into the battery-pack and charge the NiCd there with ca. 60 mA.)

!! WARNING: So never use batteries with external DC-voltage supplied after this modification, as this will 'charge' the normal batteries, which might explode and cause serious damage not only to your TH28 !!!

I could not manage it to get the diode onto the top-side of the BT8, so I opened my TH 28 (see instruction-manual) and solderd this diode onto the leads of the built-in double-diode of the charger-board. (D 201 on board X53-3400-00). This reqires a diode with a small case, a 1N4001 will be too big and has not enough

thin wires to bend them for good soldering inside the TH28-case.
(The diode D 201 disables the accu- or battery supply when the external DC-voltage is applied at the DC-in jack.)
The double-diode D201 you will find on one side of the charger-board, the two wires on one side go to +A and +B of the battery-case, check with ohm-meter.
Be careful not to damage the internal flexibel board connecting the keyboard/processor-unit and the rest...
I hope that this info might be useful as the original accu-packs of Kenwood are not the cheapest ones...
