Kenwood PMRs

This page details the conversion and programming of some of the Kenwood PMRs available on the second hand market.

<p style="text-align:center">Sorry this page is still being written, and may appear a bit confusing.</p>

There are two versions of the Kenwood Programming Software (KPG-20D and KPG-67D) on this page. They are in the downloads section below. They will program the following radios:

Model	Class	Channels	Band	Frequency Range	Bandwidth	Program Software
TK-249T	Portable Radio	200	VHF	150-174	Hardware Adjusted	KPG-20D
TK-249E	Portable Radio	200	VHF	146-174	Hardware Adjusted	KPG-20D
TK-349T	Portable Radio	200	UHF	438-470	Hardware Adjusted	KPG-20D
TK-349T4	Portable Radio	200	UHF	420-450	Hardware Adjusted	KPG-20D
TK-349E	Portable Radio	200	UHF	440-470	Hardware Adjusted	KPG-20D
TK-349M4	Portable Radio	200	UHF	400-420	Hardware Adjusted	KPG-20D
TK-709T	Mobile Radio	200	VHF	150-174	Hardware Adjusted	KPG-20D
TK-709E	Mobile Radio	200	VHF	146-174	Hardware Adjusted	KPG-20D
TK-809T	Mobile Radio	200	UHF	438-470	Hardware Adjusted	KPG-20D
TK-809T4	Mobile Radio	200	UHF	420-450	Hardware Adjusted	KPG-20D
TK-809E	Mobile Radio	200	UHF	440-470	Hardware Adjusted	KPG-20D
TK-809M4	Mobile Radio	200	UHF	400-420	Hardware Adjusted	KPG-20D
TK-762GE	Mobile Radio	8	VHF	146-174	Wide or Narrow	KPG-67D
TK-762G(N)E	Mobile Radio	8	VHF	146-174	Narrow Only	KPG-67D
TK-760GE	Mobile Radio	128	VHF	146-174	Wide or Narrow	KPG-67D
TK-760G(N)E	Mobile Radio	128	VHF	146-174	Narrow Only	KPG-67D
TK-862GE	Mobile Radio	8	UHF	440-470	Wide or Narrow	KPG-67D
TK-862G(N)E	Mobile Radio	8	UHF	440-470	Narrow Only	KPG-67D
TK-860GE	Mobile Radio	128	UHF	440-470	Wide or Narrow	KPG-67D
TK-860G(N)E	Mobile Radio	128	UHF	440-470	Narrow Only	KPG-67D
TK-260GE	Portable Radio	8	VHF	146-174	Wide or Narrow	KPG-67D
TK-260G(N)E	Portable Radio	8	VHF	146-174	Narrow Only	KPG-67D
TK-260G(N)T	Portable Radio	8	VHF	146-174 OR 136-150	Narrow Only	KPG-67D
TK-270GE	Portable Radio	128	VHF	146-174	Wide or Narrow	KPG-67D
TK-270G(N)E	Portable Radio	128	VHF	146-174	Narrow Only	KPG-67D
TK-270G(N)T	Portable Radio	128	VHF	146-174	Narrow Only	KPG-67D
TK-360GE	Portable Radio	8	UHF	440-470 OR 403-430	Wide or Narrow	KPG-67D
TK-360G(N)E	Portable Radio	8	UHF	440-470 OR 403-430	Narrow Only	KPG-67D
TK-370GE	Portable Radio	128	UHF	440-470	Wide or Narrow	KPG-67D
TK-370G(N)E	Portable Radio	128	UHF	440-470	Narrow Only	KPG-67D

Downloads

These programs, Kenwood KPG-20D and Kenwood KPG-67D programming software, seem to be freely availiable and various people are distributing it freely. I could not find a manual or an EULA for the software - I have assumed it is freely distributable. If this is not the case, I will remove this software immediately.

- **Kenwood KPG-20D Programming Software**
- **Kenwood KPG-56D Programming Software**
- **Kenwood KPG-67D Programming Software**

The end column of the list above will show you what version of the program you need.

KGP-20D Software

Sidebar

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```
Kenwood KPG-20D V1.04G File:M1GEO_70.DAT TK-809 T4          04-Dec-2010 20:21:37

   Parameter menu KPG-20D basic level

   Channel menu
   ch   ds      tx.freq.    rx.freq.    SAT tx    SAT rx    scan    clk
   45   3=100   434.70000   433.10000   OFF       OFF       YES     NO
   46   3=125   434.72500   433.12500   OFF       OFF       YES     NO
   47   3=150   434.75000   433.15000   OFF       OFF       YES     NO
   48   3=175   434.77500   433.17500   OFF       OFF       YES     NO
   49   3=200   434.80000   433.20000   OFF       OFF       YES     NO
   50   3=225   434.82500   433.22500   OFF       OFF       YES     NO
   51   3=250   434.85000   433.25000   OFF       OFF       YES     NO
   52   3=275   434.87500   433.27500   OFF       OFF       YES     NO
   53   3=300   434.90000   433.30000   OFF       OFF       YES     NO
   54   3=325   434.92500   433.32500   OFF       OFF       YES     NO
   55   3=350   434.95000   433.35000   OFF       OFF       YES     NO
   56   3=375   434.97500   433.37500   OFF       OFF       YES     NO
   57   3_400   433.40000   433.40000   OFF       OFF       YES     NO
   58   3_425   433.42500   433.42500   OFF       OFF       YES     NO
   59   3_450   433.45000   433.45000   OFF       OFF       YES     NO
   60   3_475   433.47500   433.47500   OFF       OFF       YES     NO
   61   3_500   433.50000   433.50000   OFF       OFF       YES     NO

 F1-help F2-generate F3-renumber F4-add F5-insert F6-delete F7-edit
```

Kenwood KPG-20D Software

KGP-20D Usage

The usage of this software is quite complex. I wasn't able to find a manual for this program though there is apparently one. So this small section aims to outline basic functionality.

From the *Main menu*, enter the *Basic level KPG-20D*.

- Press *F3* to load a datafile. My datafile (with program from above) is called *M1GEO_70.DAT*
- Set *Priority channel:* OFF
- Set *Preference channel:* OFF
- Pressing *F7* enters the *Channel menu*
  - The *ch* column is the channel number, and it determines the channel order
  - The *ds* column is the string appearing on the screen for the given channel. This may be alphanumeric or numerical, depending on *Main menu > Setup radio > Channel readout mode*
  - *tx.freq.* and *rx.freq.* are the transmit and receive frequencies in MHz *(if you cannot enter the frequency you want, see below)*
  - *SAT tx* and *SAT rx* allow for CTCSS, DCS and SelCall to be set. Press *F1* for more.
  - *scan* allows for individual channels to be include or exclude from a scan
  - *clk* allows for the clock frequency of the radios CPU to be moved to reduce possible interference.
- From *Main menu > Advanced options*, you can select either *Keys, microphone* or *Keys, front panel* to set microphone and front panel button functions.
- Under *Main menu > Advanced options > Configuration* you can select the *TransLink port* (the programming cable port), Licencing information, and the like.
- Have a look around, using the help (*F1*) to see if you can *tweak* anything.
- Set the Encode scripts (See below)
- Return to *Basic level KPG-20D* from *Main menu*
  - Press *F5* to program the radio via the TransLink cable.
- Job done :)

Modifying Frequency Limits

Because Kenwood make Amateur Radio equipment as well as commercial, the software will not (as standard) accept frequencies in the amateur radio bands. This is easily rectified by editing the program's ".msg" file. The two images show the TK-709 T frequency range has been modified from 150-170 MHz to 140-170 MHz, thus covering the 2 metre amateur bands. This process holds for other models of radio too.
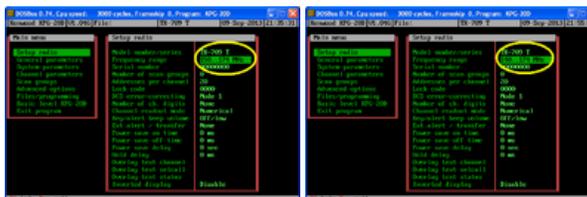

Click to enlarge

Inside your standard file browser, locate the program's ".msg" file, for KPG-20D called "Kpg-20d.msg". Open this with your preferred HEX editor. Here, I use "Hex Workshop v6.7" (free).
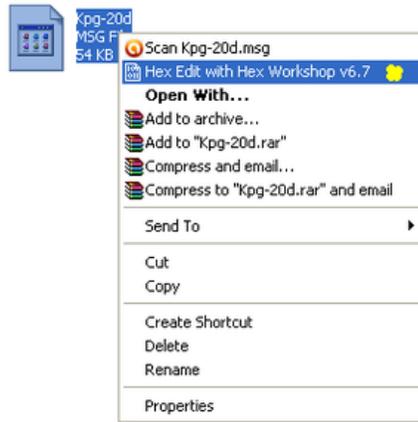
Inside the HEX editor, search for the radio model. Here, I search for "TK-709 T":
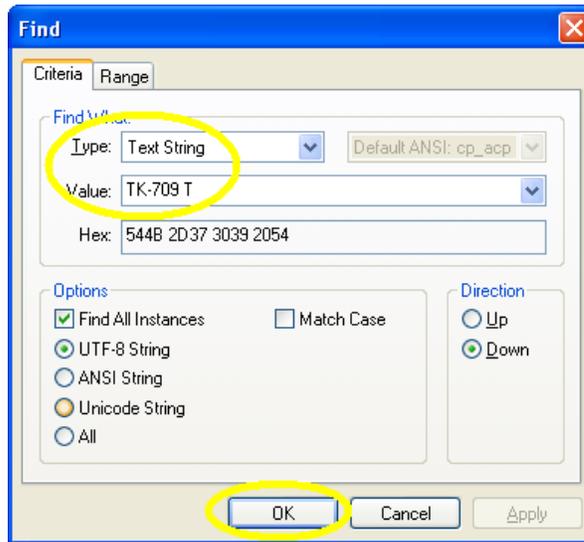

When you find the radio in the message file, you will need the frequency range label and the minimum and maximum frequency.

```
TK-709 T;0001;150..174 MHz;000;150000000;174000000;5000;6250;-34400000;160000000.P
```
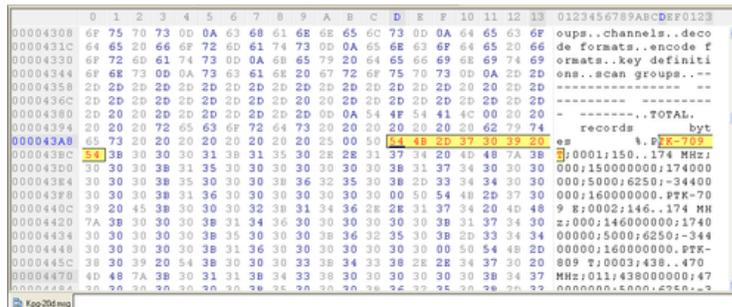

Change this to be

```
TK-709 T;0001;140..174 MHz;000;140000000;174000000;5000;6250;-34400000;160000000.P
```
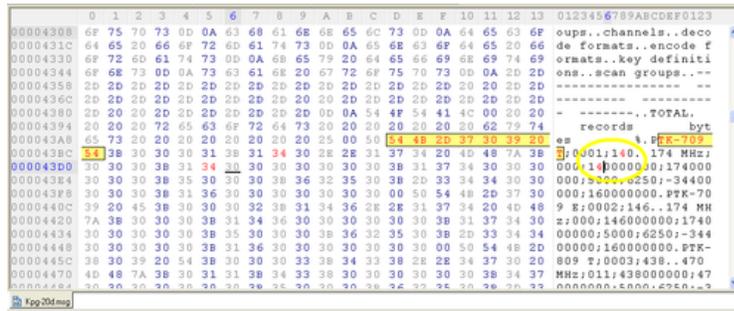
Save the HEX. Re-start the program and the frequency range will have changed. You may need to tweak the receiver tuning to improve sensitivity.

Encode Scripts

A common problem reported is that when pressing PTT, the radio transmits a carrier but no audio. This is probably due to the Encode Scripts (left image). These are set already in *M1GEO_70.DAT*. Under *Advanced Options > Encode formats*: F4 and F5 go through scripts. *TXM* enables the TX Mic audio - This fixes the problem with no TX audio.

You next need to assign this to the PTT press (right image). From the *Main menu > System parameters > F2*. Use the up/down arrows to select *Encode PTT-Press*. Then select the script you created above: Use *Insert* key to get list of scripts.
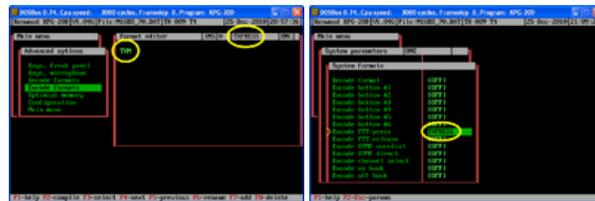
Click to enlarge

When the PTT button is pressed, the script (here called *TXPRESS*) is run. This sets the modulation source to be the microphone. Job done.

CTCSS

If you require sending tones, data, etc. this can be done with Encode scripts. Check out the Kenwood documentation in the section below. A good example is if you have programmed CTCSS or DCS options in the SAT (subaudible tones) you need to enable their transmission, with the *SCTP* instruction after the *TXM* instruction in the Encode PTT-Press script.

This data file has some repeater shifts for GB3HW and my Echolink node: CTCSS Repeater It has the SCTP instruction and TXM. It may help you understand how it works.

KGP-67D Software

Kenwood KPG-67D Software

KGP-67D Usage

This software is much simpler than the KPG-20D software. There are no encode scripts to worry about. I haven't had time to write this section up properly with images yet, but it's fairly obvious. I had results pretty much instantly with this program.

Running under DOSBox

If you are running an operating system other than Microsoft DOS or a DOS based version of Widnows (95 or 98), for example Ubuntu Linux or Windows XP/Vista (God help you)/7 you are likely to have trouble with running DOS programs. For some reason, Microsoft seem to excel at removing backwards compatability from their software. A simple away around this is to use DOSBox (http://www.dosbox.com/information.php) . DOSBox is a brilliant piece of software, for anything like this!

```
"DOSBox is a DOS-emulator that uses the SDL-library which makes DOSBox very easy to port to different
platforms."

-- http://www.dosbox.com/information.php
```

Using DOSBox we can run the Kenwood programming software under newer versions of Windows (or any other OS supported by DOSBox). It's pretty simple. Here we work through for the KPG-20D software, but the process for KPG-67D is very similar. Adjust the paths as required:

- Get DOSBox (http://www.dosbox.com/information.php) . Install it.
- Edit Dosbox.conf (http://www.dosbox.com/wiki/Dosbox.conf) to set the serial port settings (http://www.dosbox.com/wiki/Dosbox.conf#.5Bserial.5D) . You need to set *serial1*. Change *com1* to whatever com port you need. Use *ttyS0* for the first serial port on UNIX systems. Check Dosbox.conf (http://www.dosbox.com/wiki/Dosbox.conf) for details. Under Windows, use *DOSBox x.xx Options* to edit this file. Under UNIX, it's in */home/USER/.dosbox/*. Here I use a USB-Serial adapter, which is at */dev/ttyUSB0*.
   serial1=directserial realport:ttyUSB0

- Run DOSBox. You need to mount your hard drive so you can access it in the DOSBox enviroment. At the DOSBox terminal:
      mount c c:\
      c:
      cd DOCUME~1\CHRIS\DESKTOP\KPG-20D\ (change directory into wherever you extraged the program - here the desktop)
      KPG-20D.EXE

Refer to the usage section above for how to actually use the programs to set up the radios.
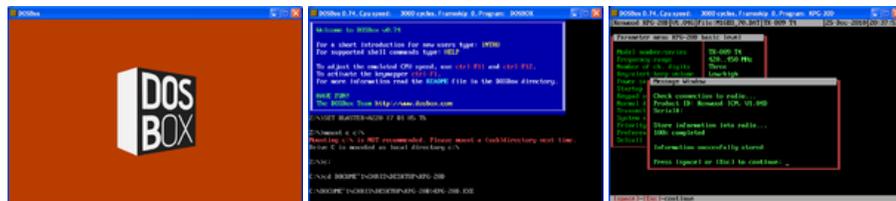
Click to enlarge

Documentation

Some useful documentation regarding the Kenwood Radios mentioned on this page..

- Kenwood ICM Functional Specification
- Microphone instruction (http://tinymicros.com/mediawiki/images/4/47/Kenwood_KMC-18A_Instruction_Manual.pdf) and service (http://tinymicros.com/mediawiki/images/e/ec/Kenwood_KMC-18A_Service_Manual.pdf) manuals.
- Notes regarding the KPG-20D Software (http://f4bqn.free.fr/Mods-tk-349/mods.pdf)

Kenwood TK-809

This section details the programming of a Kenwood TK-809 (T4) radio. Many of the radios in this series are the same, and use the Kenwook KPG-20D programming software. The Kenwood KPG-20D software is available on the internet and on many user groups. The version I have came from the radio-programming Yahoo group (http://groups.yahoo.com/group/radio-programming/) . I have also included a copy on this page with my channel data down the page.

## The Radio

The radio I mention (TK-809 T4) is shown below

Inside

Inside the radio, there are 3 variable resistors that allow you to adjust certain parameters. The red pot allows you to set the deviation on the radio. This is the same as microphone gain. The green pot allows you to set the maximum RF power output. Note that there is also a setting in software, allowing you to set (typically) 5 watts or 25 watts. You should set this to 25 watts when the radio is in the high power (25 watt) mode. The blue pot allows you to set the squelch level.

Red   Set the deviation level
Green Set the high RF power (set in software) level
Blue   Set the squelch level
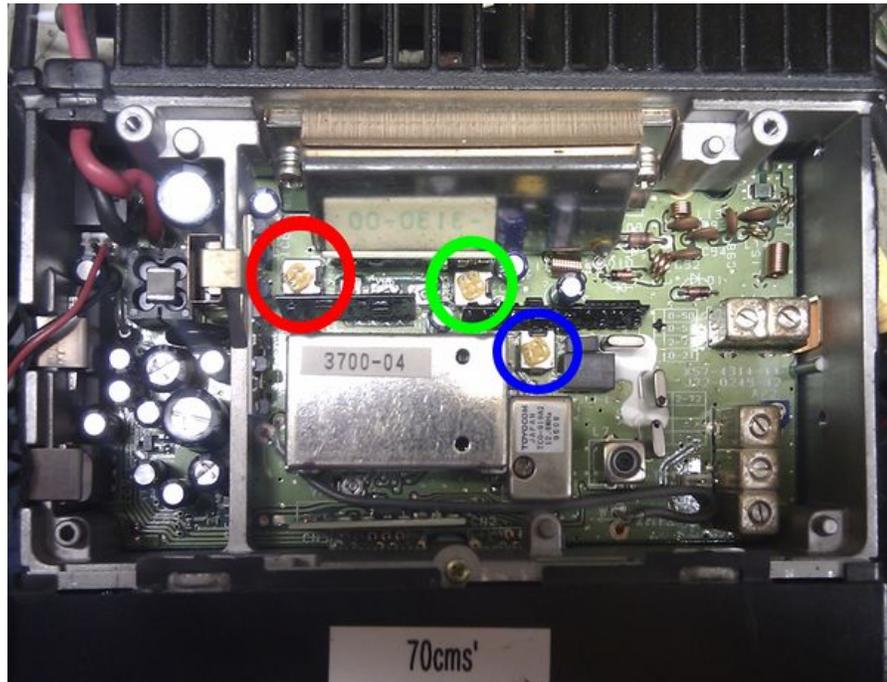

The Conversion

The data file (M1GEO_70.DAT included in the KPG-20D software) includes 432MHz to 435MHz at 25KHz spacing and also has PMR-446 frequencies programmed in. There is no CTCSS or SellCall data set, but this may be modified inside the program. It was intended for the TK-809 T4 radio, but may fit others.

	Standard LCD Display showing frequency, 3_500 translates to 43**3.500**.
	The LCD Display changes to reflect that there is a TX shift for repeater use.

	PMR 446, Channel 1 through 8.
	All segments and symbols on the LCD to test display.

Errors

From the Kenwood ICM Manual:

Error Meaning

Err 1   Hardware Fault: Tested on power-up. No real meaning behind this, other than something is wrong with the hardware

Err 2   EEPROM Error: Tested on power-up. This means that the program/channel data is corrupt (CRC error). Try reprogramming?

Err 3   PLL Out of Lock: Tested continuously. Appears when PLL is out of lock in TX or RX. Adjust VCO?

Kenwood TK-862G(N)

This radio is similar to the TK-809, though I believe slightly newer. The 862G is an 8 channel radio that is programmed by the Kenwood KPG-67D software.

Kenwood TK-762G(N)

This radio is similar to the TK-862G(N), but is the VHF version. The 762G is also 8 channel radio that is programmed by the Kenwood KPG-67D software.

- M1GEO 2M APRS (RAR compressed DAT file) - APRS Data file, contains some club net frequencies, APRS frequency and a few FM simplex channels.

Microphone Connections

The microphone socket on the this series of Kenwood radio has a 6-pin connector on the front panel. Connections for the Kenwood KMC-18 microphone are given below. There is a Instruction Manual (http://tinymicros.com/mediawiki/images/4/47/Kenwood_KMC-18A_Instruction_Manual.pdf) and a Service Manual (http://tinymicros.com/mediawiki/images/e/ec/Kenwood_KMC-18A_Service_Manual.pdf) for the microphone.

MIC connector (Front view)

8 1
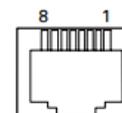
1 : BLC
2 : PSB
3 : E
4 : PTT
5 : ME
6 : MIC
7 : HOOK
8 : CM

Pin	Symbol	Connection
1	N/C	Not connected
2	PSB	Power Supply (+13.8 volts)
3	E	Ground
4	PTT	Press To Talk (Transmit)
5	ME	Microphone Earth (ground)
6	MIC	MIC/DTMF signal output
7	HK2	Hook switch output (I've no idea what this does yet?!)
8	N/C	Not connected

Categories: Radio | Electronics | Computers