TMV7A.EXE
SOFTWARE DESIGN SPEC

1.0.0

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General Requirements

1. Within this document, the following terms shall be used to mean:
2. The term “program” shall refer to the TMV7A.EXE program described in this document.
3. The term “Radio” shall refer to the TM-V7A transceiver.
4. The program shall use a standard windows interface (GUI).
5. The program shall use the Kenwood PG-4S programming cable through a standard serial interface, using any available Serial Port.
6. The program shall work with the radio as a remote control head to replace the unusable LED display.
7. The program shall emulate the radio control head as close as possible.
8. The program shall provide the capability to set the radio configuration.
9. The program shall provide the capability to control the radio using both VFO and Memory modes.
10. The program shall maintain all databases locally, not in the radio.
11. The program shall provide a detailed Help file.
12. The program shall provide Context Sensitive Help.
13. The program shall provide the capability to import data files from the Kenwood MCP-V7 radio control program.
14. The program shall provide the capability to import data files from the RCV7 radio control program.
15. The program shall provide the capability to Read, Save and Edit TMV-7 data files.
16. The program shall maintain all program configuration data in a standard Windows .INI file.
17. The program shall automatically load the TMV7 configuration data on startup;
18. The program shall automatically save the TMV7. configuration data on shutdown;
19. The program shall replace the Kenwood “CALL” channel functionality with locally maintained “FAVOURITE” channel functionality;
20. The program shall provide the following radio functionality:

    Band Select;

    VHF and UHF VFO mode;

    VHF and UHF Memory channel configuration;

    VHF and UHF Memory channel selection;

    Power On/Off;

    Favourite channel configuration;

    Favourite channel selection;

    Scan start/stop; and,

    LCD panel display status for the selected channel, including the following indicators:

    PTT - TX Band selection;

    H, M, L - RF Power selection;

    DT - DTSS code functionality;

T - PL Tone functionality;

CT - CTSS functionality;

R - Reverse Frequency functionality

S, +, - - Repeater Offset selection;

= - Split Memory Channel functionality;

LOCK - Transceiver Lock capability;

21. The program shall provide Transceiver Guide functionality;
22. The program shall provide the capability to switch the power on and off;
23. The program shall provide the capability to select the VHF or UHF band;
24. The program shall provide the capability to tune memory channels up or down;
25. The program shall provide the capability to select output power levels of H, M and L on an individual frequency/channel basis;
26. The program shall provide the capability to select a standard repeater offset direction of:

    S - Simplex;
    + - Up, or;
    - - Down;
27. The program shall provide the capability to assign a split offset frequency;
28. The program shall provide the capability to select a Tone frequency from a list of standard frequencies;
29. The program shall provide the capability to activate and de-activate the Tone function;
30. The program shall provide the capability to select the reverse function for all frequencies;
31. The program shall provide the capability to store VHF, UHF and Favourite memory channels;
32. The program shall provide the capability to select VHF, UHF and Favourite memory channels for radio operation;
33. The program shall provide the capability to edit VHF, UHF and Favourite memory channels;
34. The program shall provide the capability to clear VHF, UHF and Favourite memory channels;
35. The program shall provide the capability to name VHF, UHF and Favourite memory channels and UHF and VHF VFO frequencies;
36. The program shall replace the single “CALL” channel function with “FAVOURITE” channel functionality providing up to 12 Favourite channels;
37. The program shall provide “Scan” functionality for VHF, UHF and Favourite memory channels;
38. The program shall provide the capability to “Lockout” VFH, UHF and Favourite channels from the Scan functionality;
39. The program shall provide “”Program Scan” functionality;
40. The program shall provide the capability to enter a CTCSS code from a list of standard frequencies;
41. The program shall provide the capability to activate and de-activate the CTCSS function;
42. The program shall provide the capability to enter a DTSS code of three digits;
43. The program shall provide the capability to activate and de-activate the DTSS function;
44. The program shall provide the capability to enter up to 10 DTMF tones of 1 to 16 values;
45. The program shall provide the capability to edit DTMF entries;
46. The program shall provide the capability to clear DTMF entries;

47. The program shall provide an Automatic Power Off (APO) capability;
48. The program shall provide the capability to “Lock” the transceiver;
49. When the radio is in “Transmit” mode, the program shall display the Transmit frequency;
50. When the radio is in “Transmit” mode, the program shall display the RF output level;
51. When the radio is in “Transmit” mode, the program shall display an “On Air indicator;
52. When the radio is receiving a signal, the program shall display a “Busy” indicator;
53. When the radio is receiving a signal, the program shall display the received signal strength;
54. The program shall make maximum use of colour in the LCD display;
55. The program shall provide the capability to print formatted listings of the following files:

    TMV Data files, and

    .INI Configuration files.
56. The program shall make maximum use of “Hot Keys”;
57. The program shall provide the capability for User Registration with Nag screen;

INI FILE ENTRIES

SECTION	KEY
CONFIG	Com Port
	Colour Scheme
TMV FILES	TMVFileName
UHF	UHF Data Source
	UHF Channel Nr
	UHF VFO
	UHF RX Frequency
	UHF Step
	UHF Shift
	UHF Reverse
	UHF Tone
	UHF CTCSS
	UHF DTSS
	UHF Tone Nr
	UHF DTSS Code
	UHF CTCSS Nr
	UHF Offset
	UHF Scan
	UHF Split Freq
	UHF Split Step
	UHF RF Power
	UHF Channel Name
	UHF Comments
	UHF Audio Level
	UHF Squelch Level
VHF	VHF Data Source
	VHF Channel Nr
	VHF RX Frequency
	VHF Step
	VHF Shift
	VHF Reverse
	VHF Tone
	VHF CTCSS
	VHF DTSS
	VHF Tone Nr
	VHF DTSS Code
	VHF CTCSS Nr
	VHF Offset
	VHF Scan
	VHF Split Freq
	VHF Split Step
	VHF RF Power
	VHF Channel Name
	VHF Comments
	VHF Audio Level
	VHF Squelch Level

LCD DISPLAY

	PTT Band
VHF VFO	VHF VFO
	VHF RX Frequency
	VHF Step
	VHF Shift
	VHF Reverse
	VHF Tone
	VHF CTCSS
	VHF DTSS
	VHF Tone Freq
	VHF DTSS Code
	VHF CTCSS Freq
	VHF Offset
	VHF Scan
	VHF RF Power
	VHF MEM Name
	VHF Comments
UHF VFO	UHF VFO
	UHF RX Frequency
	UHF Step
	UHF Shift
	UHF Reverse
	UHF Tone
	UHF CTCSS
	UHF DTSS
	UHF Tone Freq
	UHF DTSS Code
	UHF CTCSS Freq
	UHF Offset
	UHF Scan
	UHF RF Power
	UHF MEM Name
	UHF Comments

TMV DATAFILE STRUCTURE

The TMV Data File consists of four header records and a series of comma-delimited entries for each section.

The Sections are [VHF MEMORY], [UHF MEMORY], [FAVOURITES] and [DTMF]. The VHF and UHF MEMORY sections can have from 0 to gv7Max_VHF_Data_Array_Size and gv7Max_UHF_Data_Array_Size records. The Favourites section can have from 0 to gv7Max_Favourites_Data_Array_Size records. The DTMF section can have from 0 to gv7Max_DTMF_Data_Array_Size.

A Default TMV file will start with all fields (null) except for the Channel Nr. Any field with a Channel Name is considered an “active” field and must contain data as detailed in the following table.

FIELD	TYPE	DATA FORMAT
VHF, UHF and FAVOURITES Sections		
Section_Header		[VHF MEMORY], [UHF MEMORY], and [FAVOURITES]
ChannelNr	STRING	[1..MaxElementNr] Array Element [1..gv7Max_VHF_Data_Array_Size]
VFO	STRING	[UHF, VHF]
RXFrequency	STRING	999.999 (Frequency in mHz)
Step	STRING	(99)9(.9)
Shift	STRING	[S, P, M]
Reverse	STRING	[Off,On]
Tone	STRING	[N, T, C]
ToneFreq	STRING	If Tone = None then field is null else (9)99.9
DTSS	STRING	[Off,On]
DTSSCode	STRING	if DTSS = Off then field is null else [000..999]
ShiftOffset	STRING	If Shift = S then field is null else 99.99
Scan	STRING	[Off,On]
RFPower	STRING	[H, M, L]
ChannelName	STRING	[5..15] Alphanumeric
Comments	STRING	[0..30] Alphanumeric
DTMF Section		
Section_Header		[DTMF]
DTMF_Channel	STRING	two digits [.00..09]
DTMF_Code	STRING	16 characters from the sets [0..9] and [A..F].

VHF DATA ARRAY STRUCTURE

The VHF Data array is a string array consisting of up to gv7Max_VHF_Data_Array_Size comma-delimited entries. Formats are defined in the TMV7.EXE Control Protocol document.

FIELD	TYPE	DATA FORMAT
VHF_MEM_Channel	STRING	Format 11
VHF_VFO	STRING	Format 3
VHF_RX_Frequency	STRING	11 digits - Freq in kHz
VHF_Step	STRING	Format 6
VHF_Shift	STRING	Format 7
VHF_Reverse	STRING	Format 1
VHF_Tone	STRING	Format 1
VHF_CTCSS	STRING	Format 1
VHF_DTSS	STRING	Format 1
VHF_Tone_Freq	STRING	Format 8
VHF_DTSS_Code	STRING	Format 9
VHF_CTCSS_Freq	STRING	Format 8
VHF_Offset	STRING	Format 10
VHF_Scan	STRING	Format 1
VHF_RF_Power	STRING	Format 12
VHF_MEM_Name	STRING	[5..15] Alphanumeric
VHF_Comments	STRING	[0..30] Alphanumeric

UHF DATA ARRAY STRUCTURE

The UHF Data array is a string array consisting of up to gv7Max_UHF_Data_Array_Size comma-delimited entries. Formats are defined in the TMV7.EXE Control Protocol document.

FIELD	TYPE	DATA FORMAT
UHF_MEM_Channel	STRING	Format 11
UHF_VFO	STRING	Format 3
UHF_RX_Frequency	STRING	11 digits - Freq in kHz
UHF_Step	STRING	Format 6
UHF_Shift	STRING	Format 7
UHF_Reverse	STRING	Format 1
UHF_Tone	STRING	Format 1
UHF_CTCSS	STRING	Format 1
UHF_DTSS	STRING	Format 1
UHF_Tone_Freq	STRING	Format 8
UHF_DTSS_Code	STRING	Format 9
UHF_CTCSS_Freq	STRING	Format 8
UHF_Offset	STRING	Format 10
UHF_Scan	STRING	Format 1
UHF_RF_Power	STRING	Format 12
UHF_MEM_Name	STRING	[5..15] Alphanumeric
UHF_Comments	STRING	[0..30] Alphanumeric

FAVOURITE DATA ARRAY STRUCTURE

The Favourites Data array is a string array consisting of up to gv7Max_FAV_Data_Array_Size comma-delimited entries. Formats are defined in the TMV7.EXE Control Protocol document.

FIELD	TYPE	DATA FORMAT
FAV_MEM_Channel	STRING	Format 11
FAV_VFO	STRING	Format 3
FAV_RX_Frequency	STRING	11 digits - Freq in kHz
FAV_Step	STRING	Format 6
FAV_Shift	STRING	Format 7
FAV_Reverse	STRING	Format 1
FAV_Tone	STRING	Format 1
FAV_CTCSS	STRING	Format 1
FAV_DTSS	STRING	Format 1
FAV_Tone_Freq	STRING	Format 8
FAV_DTSS_Code	STRING	Format 9
FAV_CTCSS_Freq	STRING	Format 8
FAV_Offset	STRING	Format 10
FAV_Scan	STRING	Format 1
FAV_RF_Power	STRING	Format 12
FAV_MEM_Name	STRING	[5..15] Alphanumeric
FAV_Comments	STRING	[0..30] Alphanumeric

DTMF DATA ARRAY STRUCTURE

The DTMF Data array is a string array consisting of up to gv7Max_DTMF_Data_Array_Size comma-delimited entries

FIELD	TYPE	DATA FORMAT
DTMF_Channel	STRING	Format 15
DTMF_Code	STRING	Format 16.

VFO DATA ARRAY STRUCTURES

The VFO Data arrays are identical string arrays with data elements prefixed by VHF or UHF

FIELD	TYPE	DATA
RXFrequency	STRING	Format 5
Step	STRING	Format 6
Shift	STRING	Format 7
Reverse	STRING	Format 1
Tone	STRING	Format 1
CTCSS	STRING	Format 1
DTSS	STRING	Format 1
ToneNr	STRING	Format 8
DTSSCode	STRING	Format 9
CTCSSNr	STRING	Format 8
Offset	STRING	Nine digits – Freq in Hz
Scan	STRING	Format 1
SplitFrequency	STRING	Format 10
SplitStep	STRING	Format 6
RFPower	STRING	Format 12
ChannelName	STRING	[5..15] Alphanumeric
ChannelComments	STRINF	[0..30] Alphanumeric
AudioLevel	STRING	Format 19
SquelchLevel	STRING	Format 20