

Hand-drawn schematic of a digital circuit for a 1000000 counter. The circuit includes a 74181 4-bit ALU, a 74190 10-bit counter, and a 7447 BCD-to-7-segment decoder. The counter is connected to the ALU and the decoder. The decoder's outputs are connected to a 7-segment display. Labels include: POWER ON, Push, Upon displaying, MEMORY X10 UP, MEMORY, CARRY, Tx, SIMPLY, FIVE, LIMIT, MODE, SCAN, and STORE.

```

the radio goes standby and displays
M:xx RX:1xx.xxxx

```

POWER OFF

Push 

The radio will emit a "Turn-Off Tone" and dies.

MEMORY X10 UP

Push "▲"

```
Memory "Ten's" digit will increment once, keep pushing, after 1 seconds it
will start automatic scrolling up, and wrapping from 9 to 0.
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When you release the button, RX frequency corresponding to that memory location will be displayed. If that memory location is empty display will show

M:xx RX:100.0000

Total 100 locations are available for user.

MEMORY X10 DOWN, MEMORY X1 UP and MEMORY X1 DOWN works similarly.

FREQUENCY

This radio has unique feature of directly calculating synthesizer telegrams from frequency entered via keyboard. Optionally one can also store this frequency in memory locations which is on the display.

If you are going to store the frequency, first select the memory location with MEMORY buttons.

Push "F"

Display will show

M:xx RX:1

Now enter wanted frequency via numeric keyboard. Last two digits will be automatically inferred from entry for 12.5 KHz raster. If this newly entered frequency is one of the Amateurs or Marine "semi-duplex / duplex" channel, the "O" lamp will lit and when PTT is pressed radio will transmit in semi-duplex frequency.

If you want to store this frequency

Push "F" for longer than 1 seconds. After 1 second display will change to

## STORING

and an acknowledge "beep" tone will be heard at loudspeaker.

### MODE

Push "M"

Memory or frequency modes is selected by this toggle button. On every push "M" or "F" lamp will lit, showing the mode we selected.

### HIGH LIMIT

Push "HI"

If we were in memory mode, the radio will display

M:xx ; SCAN HIGH

If you push longer than 1 second, the radio will display

STORING

and an acknowledge "beep" tone will be heard at loudspeaker. The memory which is on display before you start pressing will be stored as "Memory Scan High Limit".

If radio was in frequency mode, similarly first short push will display

SCAN HIGH:1xx.xxxx

and if you keep pressing more than 1 second, frequency which was on display will be stored as "Frequency Scan High Limit".

### LOW LIMIT

Push "LO"

It works similar to HIGH LIMIT button.

### TOPE

Push "T"

The radio will display

NOT IMPLEMENTED

### SCAN

Push "S"

The radio will display blinking

SCANNING

and will make "Memory" or "Frequency" scan depend on "Mode".

If we are in frequency scan, it will start from Low Limit and stop every time a carrier is detected. When it is stopped if we are in memory mode it will display

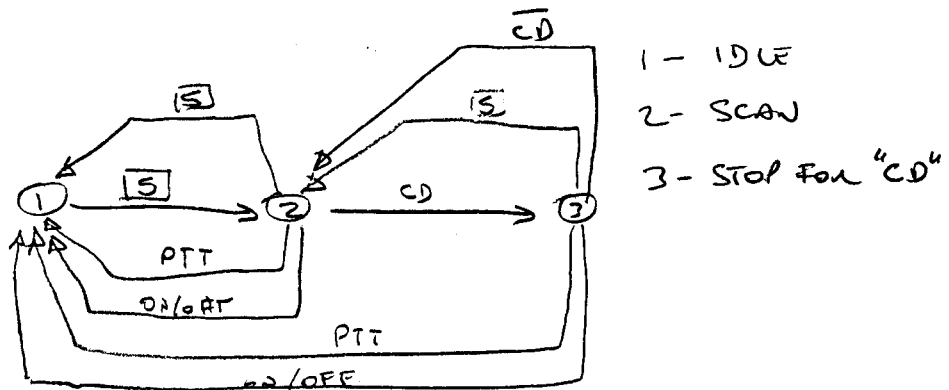
M:xx RX:1xx.xxxx

with blinking memory and frequency digits. If we were in frequency mode it will display

RX:1xx.xxxx

again with blinking digits.

Short push on SCAN button will command the radio to "Continue to Scan". PTT and POWER ON/OFF button can abort scanning instantaneously. Otherwise SCAN button works as shown in state diagram below.



## HUMBLEBI USERS MANUAL

### POWER ON

Push

Upon displaying

HUMBLEBI V.x VHF MTU

followed by designated user's name, for example

TONY SHULTZ

the radio goes standby and displays

M:xx RX:1xx.xxxx

showing which memory location in use and corresponding RX frequency.  
Memory and RX frequency will be the same as when radio was turned off.

### POWER OFF

Push

The radio will emit a "Turn-Off Tone" and dies.

### MEMORY X10 UP

Push " "

Memory "Ten's" digit will increment once, keep pushing, after 1 seconds it will start automatic scrolling up, and wrapping from 9 to 0.

When you release the button, RX frequency corresponding to that memory location will be displayed. If that memory location is empty display will show

M:xx RX:100.0000

Total 100 locations are available for user.

MEMORY X10 DOWN, MEMORY X1 UP and MEMORY X1 DOWN works similarly.

### FREQUENCY

This radio has unique feature of directly calculating synthesizer telegrams from frequency entered via keyboard. Optionally one can also store this frequency in memory locations which is on the display.

If you are going to store the frequency, first select the memory location with MEMORY buttons.

Push "F"

Display will show

M:xx RX:1 .

Now enter wanted frequency via numeric keyboard. Last two digits will be automatically inferred from entry for 12.5 KHz raster. If this newly entered frequency is one of the Amateurs or Marine "semi-duplex / duplex" channel, the "O" lamp will lit and when PTT is pressed radio will transmit in semi-duplex frequency.

If you want to store this frequency, push "F" for longer than 1 seconds, after 1 second display will change to

STORING

and an acknowledge "beep" tone will be heard at loudspeaker.

*Model*

## Mode

Push "M"

Memory or frequency modes is selected by this toggle button. On every push "M" or "F" lamp will lit, showing the mode we selected.

## HIGH LIMIT

Push "Hi"

If we were in memory mode, the radio will display

M:xx ; SCAN HIGH

If you push longer than 1 second, the radio will display

STORING

and an acknowledge "beep" tone will be heard at loudspeaker. The memory which is on display before you start pressing will be stored as "Memory Scan High Limit".

If radio was in frequency mode, similarly first short push will display

SCAN HIGH:1xx.xxxx

and if you keep pressing more than 1 second, frequency which was on display will be stored as "Frequency Scan High Limit".

## LOW LIMIT

Push "LO"

It works similar to HIGH LIMIT button.

## TONE

Push " "

The radio will display

NOT IMPLEMENTED

## SCAN

Push "S"

The radio will display blinking

SCANNING

and will make "Memory" or "Frequency" scan depend on "Mode".

If we are in frequency scan, it will start from Low Limit and stop every time a carrier is detected. When it is stopped, if we are in memory mode it will display

M:xx RX:1xx.xxxx

with blinking memory and frequency digits. If we were in frequency mode it will display

RX:1xx.xxxx

again with blinking digits. Low limits should be lower than high limits.

In memory scan, all related memory locations should contain relevant frequencies. ~~In frequency scan "Self quieting" frequencies in Amateurs band scan will be jumped over.~~

Short push on SCAN button will command the radio to "Continue to Scan". PTT and POWER ON/OFF button can abort scanning instantaneously. Otherwise SCAN button works as shown in state diagram below.

## PTT

Press "PTT"

Display will change to

M:xx TX:1xx.xxx

"red arrow" light will lit, if you were in one of the repeater frequencies and there was no carrier previous to PTT a 1750 tone will be transmitted for 1.5 seconds and it will be heard in loudspeaker.

A "built in test" monitor continuously checks the software integrity. If rightmost lamp ever starts blinking, note the circumstances and report.