

# Set the frequency of rubidium oscillator

(FE5680A updated description of 2005.10 on March 27 was added)

Recent somewhere in the rubidium frequency standard has obtained some type of FE5650A FREQUENCY ELECTRONICS manufacturers say.

Very small (about 75 x 75 x 40mm) so interesting for many it is embedded.

But to obtain it tried to measure the frequency 8.388608MHz (2 ~ 23Hz) and a special general 10MHz frequency was not the frequency or manufacturer's site is downloaded from a catalog in the catalog Option Special of the describe about 58品RASHII may not have noticed.

[FEI's product information page](#)

According to the catalog above the rubidium frequency of 1Hz from the factory option that can be set up to 20MHz.

(However, when the square wave sine wave of 1Hz ~ 10MHz at 5MHz ~ 20MHz)

Changes in the frequency and I tried to challenge

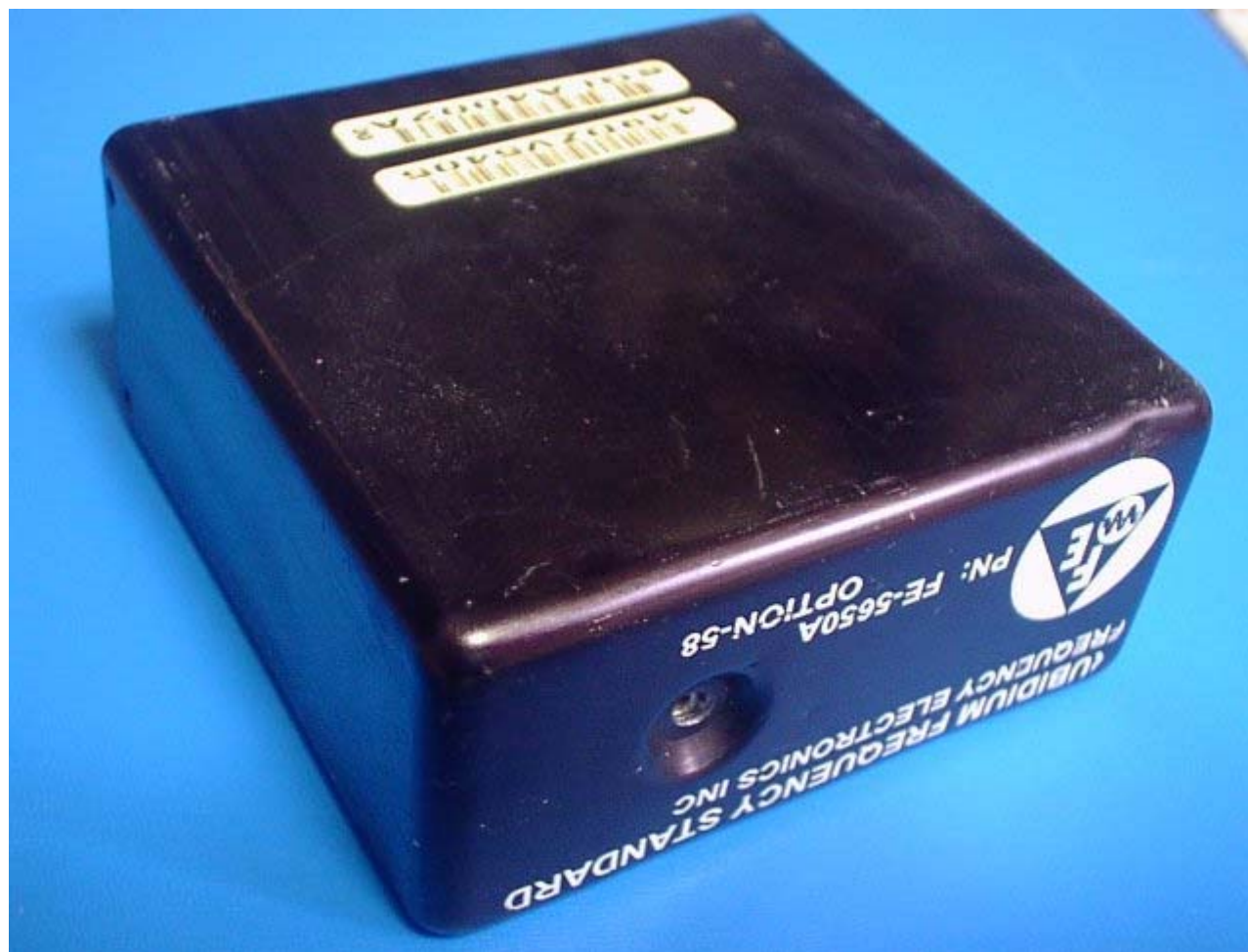


Photo 1. The rubidium is obtained.



2. Synthesizer board



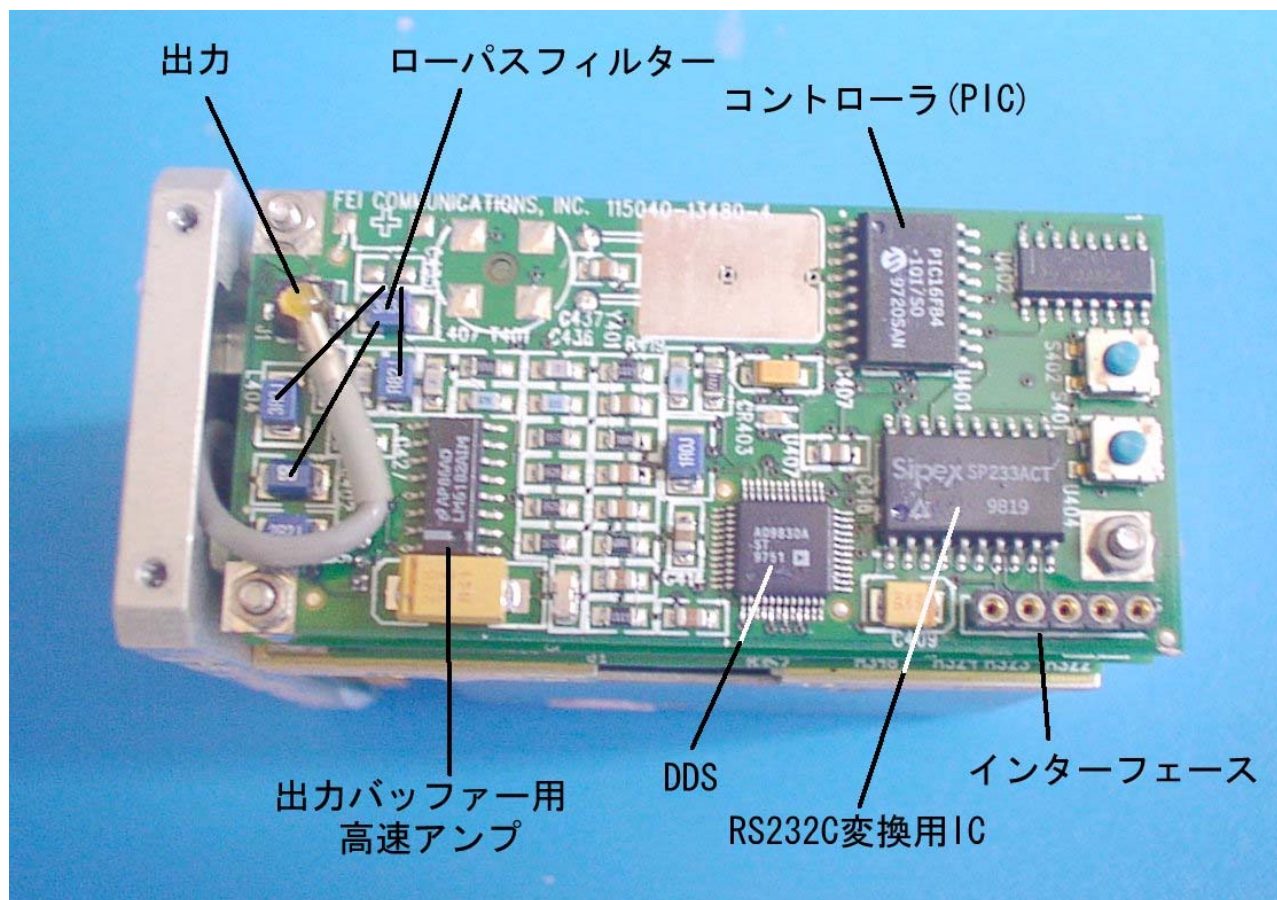


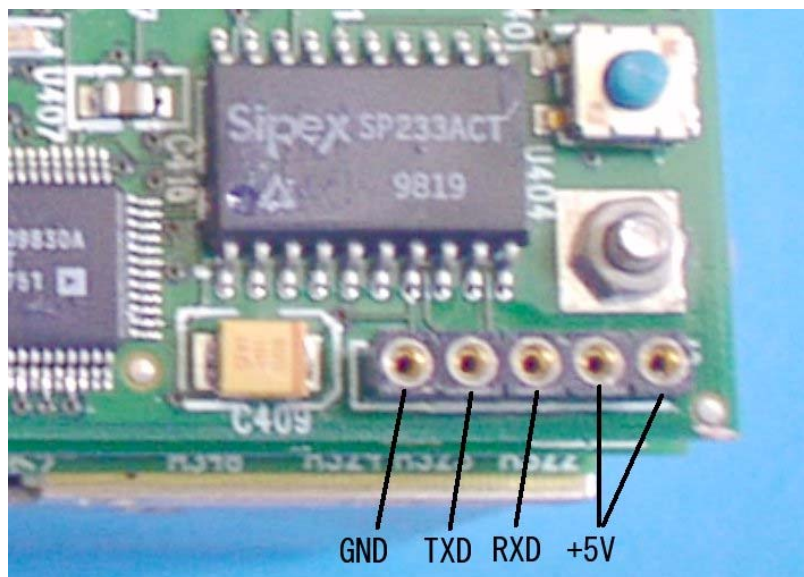
Photo 3. Synthesizer expansion of the board's ANAROGUDEBAISEZU AD9830A synthesizer that the DDS is used.

The resonant frequency of rubidium clocks 6834.6875MHz to 1 / 136 in 50.255055MHz.

The DDS to change settings that can be configured with any frequency.

Rb87 the resonant frequency of 6834.6826128MHz According to the literature of the PRS-10 in the SRS and that this frequency is FEI's EFRATOM and that's why is 6834.6875MHz. Maybe the pressure of the gas cell BAFFAGASU and I think the difference is due to know more. Once more, or to anyone you please tell me

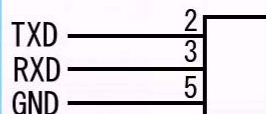
Two other push-button switch, which will see an increase in the value of the setting in a decrease in the other Which is either immediately forgot about it tells the press. The result pushed the button to power memory is not clear cut, so even when you do not need to please people not to touch the fine-tuning <BR> even if it can be set here.



#### 4. Communication Ports



RS232C用  
9pinコネクタ



#### 5. Communication Cables

How do I actually set up to make such a cable from your PC's serial port on the controller board to send a command to set the frequency.

Communications software is included with the Windows HyperTerminal was used to feature a special terminal software does not use anything so good.

9600 baud rate data communications format is 8 bits 1 stop bit  
No flow control is no parity.

<BR> First **communication** from the keyboard to S (CR), please quotes

(Note. (CR) is the Enter key on the keyboard. The following operation is similar.)

Then, from the controller

R = 50255057.015837Hz F = 2ABB504000000000

OK

There are a response. (This is an example of changes in the value of the individual.)

The meaning of this value

R = is in the DDS frequency, F = is the value in the DDS.

So from the keyboard

F = XXXXXXXX (CR)

To enter and change settings. (XXXXXXXX part of the 8-digit hexadecimal).

Returns from these controls is to enter a 16-digit value to 8 digits so間違ENAI

The value of R = you can change like that to change this number and nothing happens.

Apparently, this value is calibrated to record the frequency of time you set up F = calibration value is calculated as I would like to use.

Finally, E (CR) and enter the frequency of memory and above.

Do not do this, turn the power off and go back to the original value, so please be careful or complete set.

**How to calculate the value** DDS is set <BR> setting the value of the 32 pits in the eight-digit

number written in hexadecimal.

For more information on the AD9830 ANAROGUDEBAISEZU of the company's Web site to download the data sheet, please read it

Because writing is done with a little more.

Will be entered in the DDS frequency 50.255XXXXMHz (R) DDS in the number of bits of the accumulator is a 32-bit values per 1-bit

$R / (2 \sim 32) = 0.01170xxxxx$  (Hz).

So for example the frequency of 10MHz and

$F = 10000000 / 0.0117xxxxx = 854633852$

This is in hexadecimal notation

$F = 32F0AD7C$

. (This is just one example of dedicated and precise not to 10MHz)

(Note frequency is 5MHz ~ 20MHz PIC program is limited to want to set in and out of range that was not working properly)

**Other points to remember** about 0.0117Hz step <BR> set frequency, and this odd situation because the value set by the values of the maximum error occurs 0.006Hz.

If you want to change the frequency of how often do not even try to use a fixed frequency of the photos under a slightly trimmer ( $\pm 0.01$ Hz place) then you can adjust.

However (of course) in order to adjust the same as or higher than the frequencies with an accuracy of 0.001Hz standard and compare the frequency with the resolution of the instrument is required.



## 5. Frequency Coordination

Finally, the frequency of the frequency standard machines and a lot of things have changed and is noticed in the KATAROGUSUPEKKU 5MHz ~ 20MHz frequency range is 11MHz and above level frequencies decrease in output seen in practical scope of work The limit at 13 ~ 14MHz or 18MHz to 19MHz so you can not use the low-level or解RIMASHITA

(The first one was a Mite Shika frequency, so that I could not immediately)

The DDS output 8.38MHz of the best in the low-pass filter is designed to work.

(This option is the factory side, I think the reason why.)



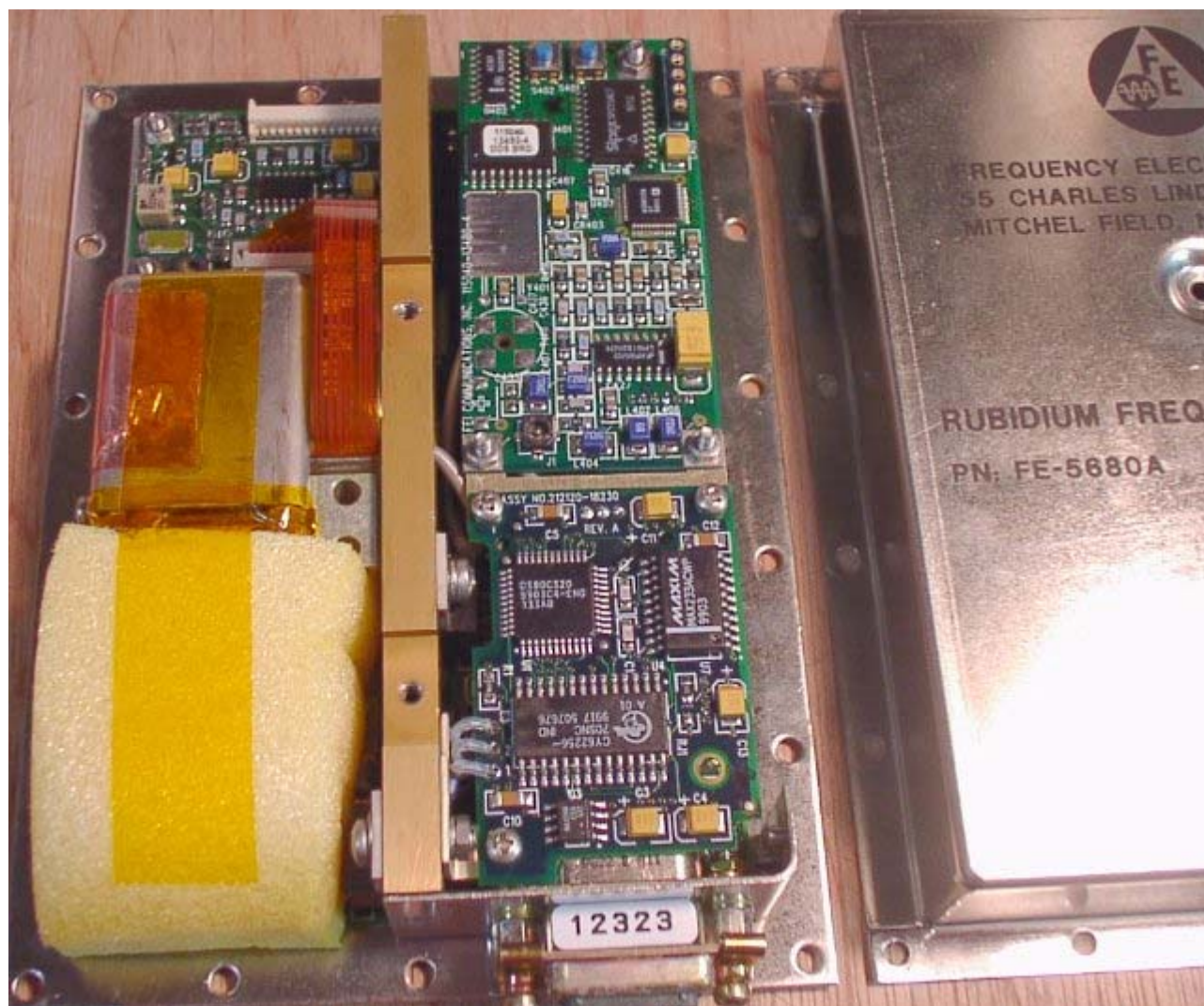
15MHz low-pass filter in place of constant change and I think that the DDS is unique in more than 17MHz frequency spurious LPF is coming not only need to be used in conjunction with the BPF may also

## FE5680A and rubidium (2005.10)

Recently a new type of new obtain rubidium was larger than this size is above 25mm thick and very thin.



Photo. The rubidium is obtained.



Inside.

Unlike some parts of the interior are the same as on the most.

How to change the frequency at the same frequency were also fine-tune the AKENAKU case of a small adjustment Trimmer in a hole can be seen from.

Is just a memorandum on how to do so as it did not work out this precious thing KOWASHITA oscillator oscillation frequency of claims and does not accept requests for a change in the sales of this standard has not even seen it If you are running only in self-responsibility.

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And other questions [here](#).