

20 MHz SWEEP/FUNCTION GENERATOR “GB-4000”

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Operating Instructions and Manual

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Important Notice

Please, read the manual instructions and watch the Quick Start Video. Do not call unless you have already done this. Also please get a surge protector power strip so that both power supplies can be plugged into one 110 volt outlet. *Failure to do this will void your warranty.*

GB-4000 Auto Channel Instructions: If you have purchased the GB-4000 and have frequencies programmed into it, this is how you run the programmed channels. First check your programmed channels and see which channel you want to run. You will use the numerical number assigned to that channel. You will then press *Auto Channel* on the keypad, then press the assigned number using the keypad, and then press *Run*. The instrument will then run all the frequencies for that channel.

For an example to run channel number 160 all you would do is press Auto Channel, then press 160, then press Run. The instrument will run all the frequencies in that channel.

Please be aware that the instrument may go through one to six groups or up to 48 frequencies depending on how many groups or frequencies are in that channel number. G is for groups and F is for the number of frequencies that will be run. You will see this on the LCD. Each group or frequency will run for 5 minutes. If there are 4 groups or four frequencies it will take 5 minutes per group or 20 minutes to go through them all. When the instrument goes back to START you are finished with that channel number.

Square wave Duty Cycle Instructions for those who own a GB-4000 and SR-4: The default square wave duty cycle in "RF Mode" is set at 70% and should remain there unless you understand how it works and why you want to change it. The period or decimal point button is for changing this duty cycle. If you do change the square wave duty cycle to a higher percentage then you should use gating. The default gating for those who do not own a MOPA should be set at a 1000 Hertz gate rate with a 75% gate duty cycle. The "Gate" duty cycle is not the same as the square wave duty cycle and can be accessed by pressing the "Gate" button on the keypad. See the GB-4000 operational manual and DVD for more information.

Square wave Duty Cycle Instructions for those who own a GB-4000 and MOPA: For those who own a MOPA the GB-4000 should be put in "Audio Mode" using the "RF/Audio" button on the keypad. The default square wave duty cycle should be set at 90% and should remain there unless you understand how it works and why you want to change it. The period or decimal point button is for changing this duty cycle. If you do change the square wave duty cycle to a lower percentage then you will notice the power level will also drop. Gating is optional. Gating is just an additional pulsing of the frequencies. The default gating for those who own a MOPA should be set at a 1000 Hertz gate rate with a 50% gate duty cycle. The "Gate" duty cycle is not the same as the square wave duty cycle and can be accessed by pressing the "Gate" button on the keypad. See the GB-4000 operational manual and DVD for more information.

New Software Features not included in DVD

1. "Audio Mode" frequency range increase: The GB-4000 audio frequency range has been increased. You can still run up to 8 frequencies simultaneously to 40,000 Hertz but you can now run 1 frequency up to 400,000 Hertz in "Audio Mode".

2. M.O.P.A "RF Mode" capability: The new M.O.P.A's have the ability to work in the "RF Mode" from 1 to 20,000,000 million Hertz. If you have an older M.O.P.A you must make sure that your M.O.P.A has the new updated circuit to use this feature otherwise you will damage the old M.O.P.A circuit and it will require a return to the factory for repair.

3. RF/Audio mode save feature: The GB-4000 originally defaulted into RF Mode. Even when the user put it into Audio Mode, when the instrument was turned off it would default back into RF Mode. Now with the new save feature, the GB-4000 will stay in the mode that you put it in. This feature is of more importance to those who have a M.O.P.A because the GB-4000 must always be put into "Audio Mode" unless the M.O.P.A has been updated to work with the "RF mode".

4. One Hundredth of One Hertz resolution: The GB-4000 originally had only a 1/10th of a Hertz frequency resolution (2000.7 Hz). This has now been changed to 1/100th of a Hertz resolution. This means that you now have two number entries after the decimal point in stead of only one (2000.79 Hz).

5. Mute beeper feature: The new Mute feature mutes the beeper while the instrument is running. Sometimes people do not want to hear the beeper when they are using the GB-4000. To use the new mute feature all you have to do is push the number 4 after the channel starts running and it will mute the beeper until the channel stops running.

6. Skip group or frequency feature: The new Skip feature allows you to skip a frequency group or a frequency. Sometimes you may have to stop running a channel before you are able to finish it. This feature allows you to skip ahead to the group or frequency that you were running when you had to stop the program. To use this skip feature all you have to do is push the number 6 after a channel starts running and it will allow you to skip a frequency group or a frequency.

7. Save Gating to a channel feature: The Save Gating to a channel feature allows you to save the Gating feature to a channel. There are some channels that always use gating. This feature allows you to save it to a channel so that you do not have to turn it on every time you use the channel. To use this feature you press the Gate button. You will be given four options. Choose number 4. The LCD will display "Auto Channel". Enter the auto channel number in which you want the gating to always be turned on. Then press the Enter button and the GB-4000 will save that setting. To un-save this setting in a channel repeat this same procedure.

8. Variable Channel Sweep: The new Variable Channel Sweep allows you to choose a sweep range from 2 Hertz to 20,000 Hertz. If you have a frequency in a channel of 2000 Hertz and you decide that you want to use a 300 Hertz channel sweep then the sweep will start at 1850 Hertz and stop at 2150 Hertz. This same 300 Hertz sweep range will be done for every frequency which is programmed in the channel. This same sweep can also be used with an individually run frequency. To use this feature press the Channel Sweep button. Then enter, using the keypad, the frequency range you want to use. Then press the Enter button and the instrument will go back to Start. Then press the Auto Channel button and enter the auto channel you want to run. Then press run. The instrument will then vary the frequencies by the amount of the channel sweep range you chose to use.

30 MHz 1-15 Watt Linear Amplifier

SR-4 Amplifier

*Now increased to 30 Watts peak power output.
4 hookups - Built to work exclusively with the "GB-4000"*



All though the "GB-4000" works great alone, many people have asked if it was possible to increase the power output of the "GB-4000".

With this in mind we developed the "SR-4" amplifier with a 1 to 15 watt RMS power output and a 30 watt peak power output.

Function generators cannot put out 30 watts peak power but a separate amplifier can. To get the power output of the "SR-4" amplifier

all you have to do is plug the "GB-4000" into it. The amplifier then amplifies the "GB-4000's" frequencies from 1 to 30 watts peak power.

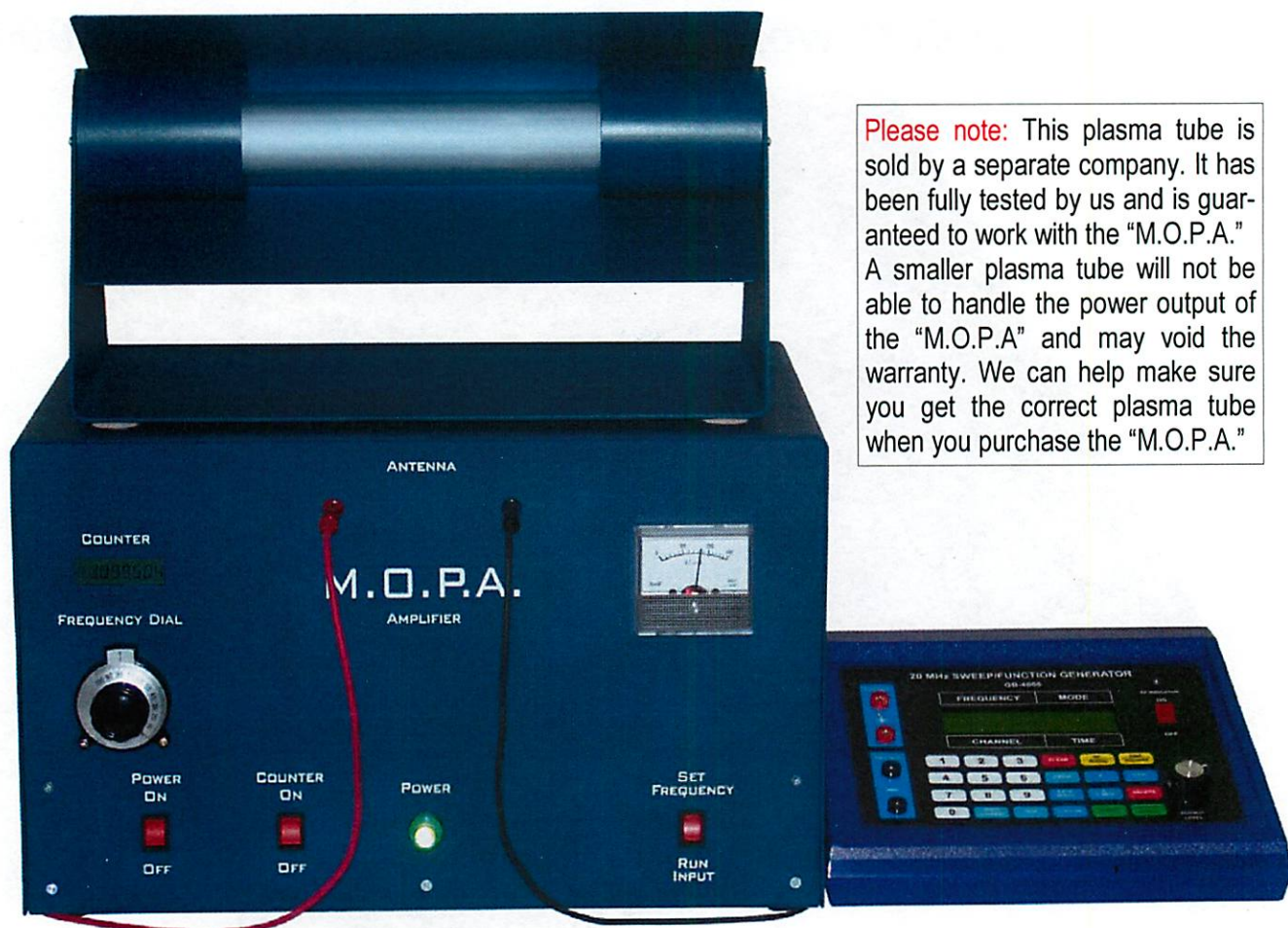
One of the great features of the "SR-4" is more hookups. The "SR-4" now has four sets of hookups for multiple use. All the positive out hookups are connected together and all the negative out hookups

are connect together so it does not matter which one you use.

If you are considering purchasing the "GB-4000" and want to have the advantages of the model "SR-4" 15 watt RMS power and 30 watt peak power output amplifier then all you have to do is order it when you purchase the "GB-4000".

M.O.P.A. Amplifier

***For those who want more Power! "M.O.P.A."
207 Watts - Works exclusively with the "GB-4000"***



Please note: This plasma tube is sold by a separate company. It has been fully tested by us and is guaranteed to work with the "M.O.P.A." A smaller plasma tube will not be able to handle the power output of the "M.O.P.A." and may void the warranty. We can help make sure you get the correct plasma tube when you purchase the "M.O.P.A."

The new "M.O.P.A." (Master oscillator power amplifier) 103 watt RMS power and 207 watt peak power RF amplifier is the newest frequency generator/amplifier we produce. It is an updated replica of the original old vacuum tube equipment that was built during the 1930's/1950's era.

Though it has been updated with modern electronics it still uses the RF tank coil and 812a vacuum tube needed to produce the original sine wave and square wave waveform

output from that old 1930's/1950's style of equipment.

It has a variable frequency range from 2.2 to 3.8MHz and when producing harmonic sidebands its frequency range goes from 1.7 to 4.3MHz. It is connected to the "GB-4000" through a BNC connector. When connected to the "GB-4000" the audio frequencies can be amplified by the "M.O.P.A." amplifier and output through the noble gas filled plasma tube.

The "M.O.P.A.s" RF output frequency then becomes the carrier frequency for the audio frequencies output from the "GB-4000".

The "M.O.P.A.s" RF output frequency can also be set to a specific frequency within its frequency range. That frequency can then be gated or pulsed with a duty cycle from a 10% to a 90% output from the "GB-4000." To see the "M.O.P.A.s" specifications please read the next page.

The "GB-4000"

Thank you for purchasing the "GB-4000" function or frequency generator. We believe that this generator is ahead of the present generation of frequency generators.

The "GB-4000" can change the Duty Cycle from 10% to 90% with a touch of a button.

The "GB-4000" also has a Gate feature that allows you to set the gate from 5 to 2200 Hertz. It also allows you to set the duty cycle of the gate from 10% to 90%.

Other frequency generators only have two connectors. The "GB-4000" has four, doubling its capability.

No other function generator on the market today can run 8 frequencies simultaneously. Almost all other frequency generators can only run one frequency at a time. The "GB-4000", however, can run up to 8 frequencies at once up to 40,000 Hertz making it 8 times faster to use. What used to take 24 minutes will now take 3 minutes with the "GB-4000". Do you have lots of time?

The GB-4000 can also run 2 frequencies at the same time from 40,000 Hertz to 20 MHz.

The "GB-4000" also has the option to use a 3.1 MHz (million) carrier frequency. It can modulate 8 frequencies up to 40,000 Hertz. It can also output 2 frequencies from 40,001 Hertz up to 20 MHz. In order to match these capabilities one would need to purchase 9 crystal controlled frequency generators.

The "GB-4000" has a channel sweep feature which has been developed for more diversity. This allows it to run a 10 to 1000 Hertz frequency sweep. This allows the user to sweep a frequency 50% below to 50% above the targeted frequency. No other portable frequency generator, that we know of, has this capability.

The "GB-4000" can run in either Audio Mode or RF Mode. Audio Mode does not use the 3.1 MHz carrier. RF Mode uses the 3.1 MHz carrier frequency.

The "GB-4000" has the ability to sweep up or down through hundreds or millions of frequencies over a pre-selected period of time. The advantage to this is you can run through many frequencies one right after another in your testing.

The "GB-4000" has 2000 programmable channels. Once programmed they become Auto-Channels.

The "GB-4000" also comes with software that will allow you to program channels with frequencies using your computer. This allows you to create your own custom channels using a computer.

Specifications

FREQUENCY CHARACTERISTICS

Wave form:	Square & Sine.
Output:	Digital converted to Analog output.
Range:	0.1 Hz to 20 MHz.
Built-in:	3.1 MHz carrier frequency.
Built-in:	DSP Processor that outputs 8 frequencies to 40,000 Hertz.
Built-in	2 AD9852 DDS for 2 frequency output to 20 MHz.
Tuning range:	Crystal controlled.
Duty cycle:	10% to 90% Variable.
Gate rate:	5 to 2200 Hertz.
Gate duty cycle:	10% to 90% Variable.
Operating modes:	Normal, sweep, AM modulation.
Frequency stability:	The output will change less than 0.001%.

OUTPUT CHARACTERISTICS

Impedance:	500 Ω $\pm$ 10%
Amplitude Control Variable. Audio Mode: 0 to 40 Volts Peak to Peak	
Amplitude Control Variable. RF Mode: 0 to 100 Volts Peak to Peak	

The "GB-4000" contains 20 million frequencies from .1 Hz to 20 MHz and a 3.1 MHz carrier frequency. The "GB-4000" has 2000 programmable channels. Once programmed, they become "Auto-Channels." An "Auto-Channel" is a pre-programmed group of frequencies. It may contain up to 48 individual frequencies. The "GB-4000" has 2000 programmable channels which can run frequencies in either single or multiple mode. In single mode, the "GB-4000" will run up to 48 frequencies one right after another. In multiple mode, the "GB-4000" will run 8 frequencies at a time, simultaneously, with up to 48 frequencies per channel.

What Is The RF Indicator Light?

The RF indicator light is located on the keypad right above the on/off switch. Because you cannot feel the frequencies when the instrument is in RF mode, the indicator light was put into the instrument to let you know that the RF circuitry is working properly. When the instrument is running frequencies in RF mode the light will come on when you turn up the output knob. It will grow brighter as the output knob is turned up. If no frequencies are running, the light will not turn on. If the light quits working when in RF mode, this is an indicator that the RF section is no longer working. You will want to contact the manufacturer for repairs.



Keypad Functions

"AUTO CHANNEL" - selects a programmed custom channel which the user desires to run.

"BACK SPACE" - allows you to remove and replace a wrong number that you have entered.

"CHANNEL SWEEP" - sweeps through a series of frequencies which can range from 5 frequencies below to 5 frequencies above the targeted frequency up to 500 frequencies below to 500 frequencies above the targeted frequency.

"CLEAR" - clears display and returns LCD display to "START".

"CUSTOM" - combines a string of frequencies as a customized auto-channel.

"DELETE" - deletes numbers entered by mistake. Also can delete an "Auto-Channel."

"ENTER" - allows user to enter an individual frequency to be run immediately or to be stored in a custom channel. Also when changing the duty cycle or gate duty cycle enter allows you to enter the changed value. When hit repeatedly, the "ENTER" button skips through a sequence of frequencies to the frequency you want to begin with or change.

"GATE" - allows you to turn the gate feature on or off or save gating turned on for any auto channel. It also lets you set the gate rate from 5 to 2200 Hertz with a 10% to 90% duty cycle.

"RUN" - starts running a selected frequency or auto-channel.

"RF/AUDIO" - changes from "RF Mode" to "Audio Mode."

"SINE/SQUARE" - used to change the frequency waveform from square wave to sine wave.

"SWEEP" - allows the user to pick a beginning and ending frequency and then sweeps that frequency through all frequencies in between the beginning and ending frequency.

"+/MOD" - connects auto-channels so that you can run several auto channels one right after another. It is also used to adjust the percent of modulation.

"•" - used when entering frequencies requiring a decimal point. Also used for changing the duty cycle from 10% to 90%.

"4" - number four button allows you to mute the beeper after the instrument starts running.

"5" - number five button allows you to pause the instrument after it starts running.

"6" - number six button allows you to skip a frequency or a group of frequencies after the channel starts running.

"INTENSITY KNOB" - allows user to adjust the intensity of the channel being run.

Warranty And Repair

The "GB-4000" comes with a 1 year parts and labor warranty. You should contact your distributor with any warranty or repair problems. If for some reason you cannot contact your distributor you may contact AAA Production Inc., at 1-888-486-4420.

How to Adjust the Output Level

When in "Audio Mode", please make sure the output knob is turned all the way down (counter-clockwise) before turning the instrument on. If you don't, you may receive an intense and unpleasant jolt. Each time the machine beeps between frequencies in "Audio Mode", always turn the output knob all the way to the left to ensure a smooth transition from weak frequencies to strong frequencies.

When using the instrument in "RF Mode" you should turn the output knob all the way up so that the RF indicator light is on. You will not need to turn the output knob down when the instrument changes frequencies in "RF Mode" because when in "RF Mode" you cannot feel anything and you will not get an unpleasant jolt.

Terminology

Frequency - actual frequency to be run or actual numerical frequency reading on the instrument's LCD.

Auto channel # - a numbering system for a pre-programmed channel whether single mode, multiple mode or customer-programmed channel.

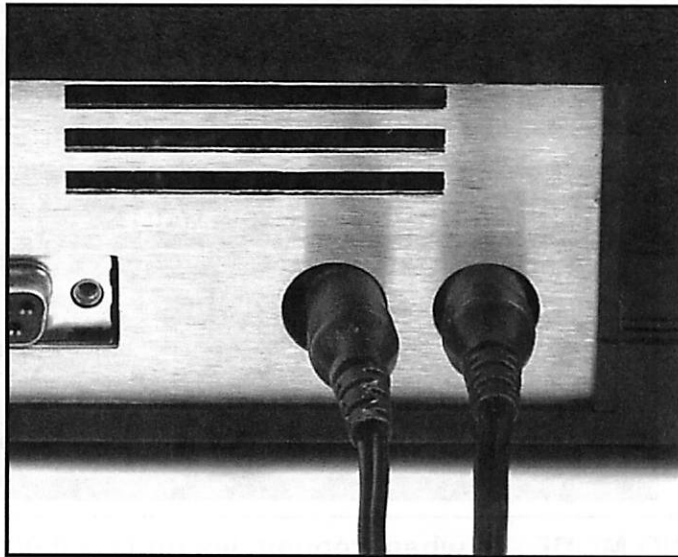
Instrument Care

Excessive heat may damage the unit. Keep the frequency generator out of hot cars, away from direct sunlight coming through a window, or from any appliance which will create extreme heat. There are no user-serviceable parts inside the frequency generator; therefore, opening it may cause damage which will void all warranties. Do not allow the contacts to touch each other because this will cause a short and may damage or ruin the generator. Because there are two power supplies **YOU MUST** use a power strip or surge protector with several plug-ins or you will void the warranty. *Also turn the instrument off after you finish using it, this will extend the life of the instrument. If you forget to turn off the instrument then the instrument will start beeping after 1 hour and will not stop beeping until you turn it off. Also it would be wise to turn off the power strip or surge protector, otherwise power will still be going to the power supplies.*

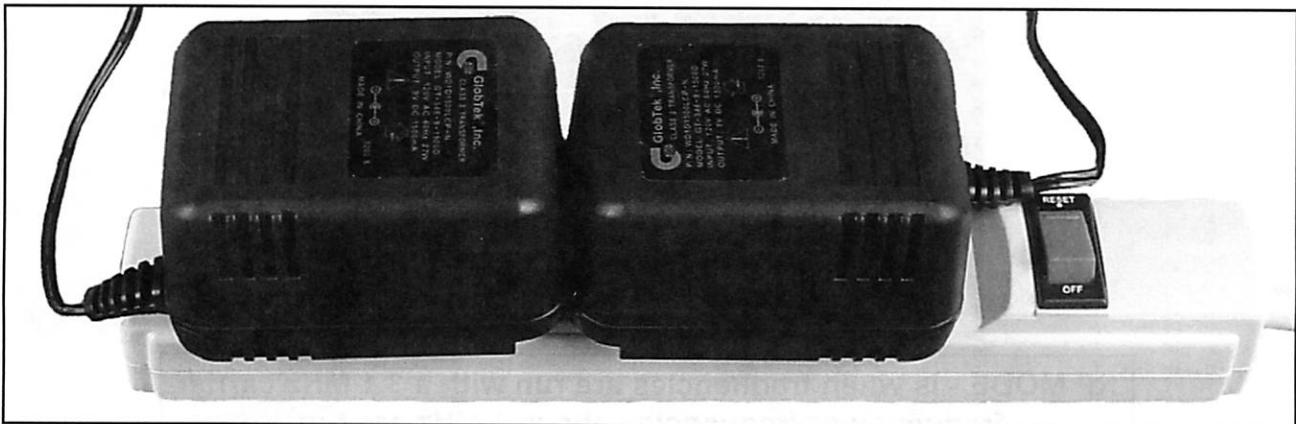
Hearing Impaired

The warning signal (beeping) has been set to a high level to get the user's attention so as to ensure a smooth transition between frequencies. The beeping alerts the user to turn the output knob all the way down when the instrument is being used in audio. This beeper can be muted by the user.

Setting Up for the First Time



Plug the adapters into the back of the "GB-4000" then into a power strip or surge protector. If you fail to use a power strip or surge protector it will void your warranty.

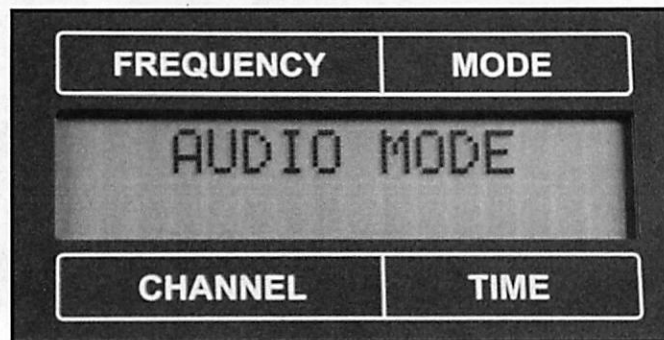


Turning on the GB-4000



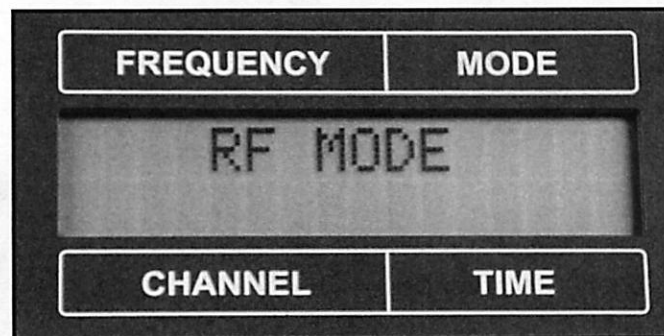
Turn on the GB-4000. LCD will say "START".

What is the Audio Mode?



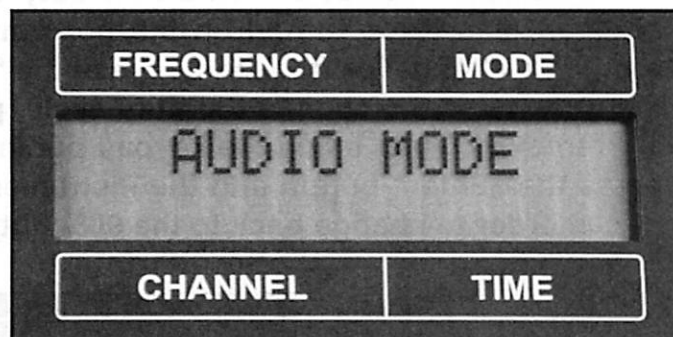
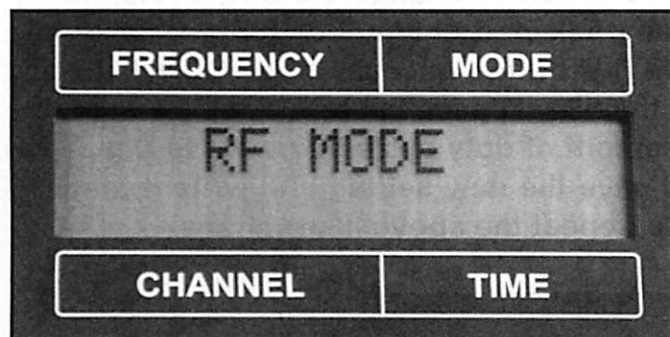
AUDIO MODE - is when frequencies under 40,000 hertz that are run without the 3.1 MHz carrier frequency.

What is the RF Mode?



RF MODE - is when frequencies are run with a 3.1 MHz carrier frequency or frequencies above 1 MHz are run.

Changing from RF to Audio Mode



The "GB-4000" has two different modes "RF Mode" or "Audio Mode." In "Audio Mode" the RF Indicator light will not come on. In "RF Mode" the RF Indicator light, above the On/Off switch, will come on. The RF Indicator light will start coming on when the output knob is in the 3 O'clock position and will be at full power output when it is turned all the way up to the 5 O'clock position. To use the "RF Mode" or "Audio Mode" make sure that you are in the mode you want to use. To check or change the mode, the instrument has to be turned on but not running any selected channel or frequency. Before running a desired channel or frequency, press the "RF/Audio" button once and the LCD will display the current mode. To change the mode, press the "RF/Audio" button once for the display and then immediately press the "RF/Audio" button again and it will change to the opposite mode. *Please note that the instrument will not change to the new mode until the words go off the LCD.* To change back to the "RF Mode", repeat the above instructions. Please keep in mind that the GB-4000 will save whatever mode you put it in until you change it.

Also when the GB-4000 is used with the M.O.P.A it must always be in "Audio Mode."

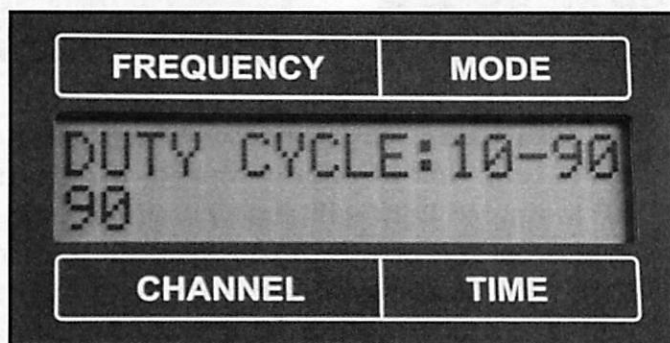
What does Duty Cycle Mean?

Duty Cycle is how long the frequency is on and off when the frequency generator is running. For example, if you are running the frequency 100 Hertz, the frequency is cycling 100 times per second. A 50% duty cycle means that the frequency is on 50% and off 50% of each second. The 90% duty cycle means that the frequency is on 90% and off 10% of each second. The "GB-4000" has a variable easy-to-adjust duty cycle.

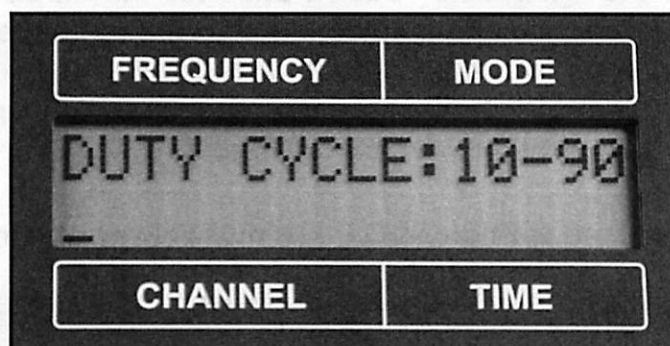
The "GB-4000" gives you the option of changing the duty cycle of the frequency generator. The "GB-4000" comes preset on a 90% duty cycle. If you want to use a different duty cycle then you will have to change it.

Checking or Changing the Duty Cycle

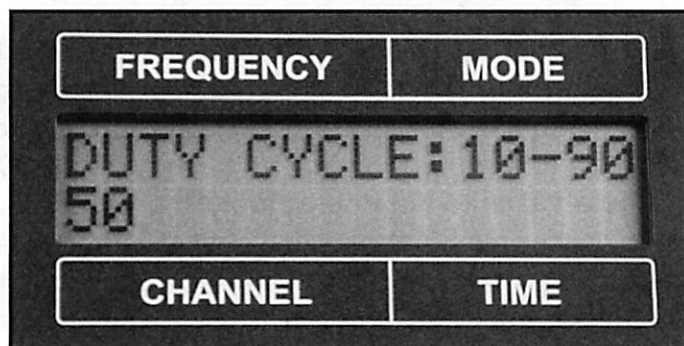
The "GB-4000" comes set on a 90% duty cycle. To check or change the duty cycle, the instrument has to be turned on but not running any selected channel or frequency. Before running a channel or frequency, press the "Period (●)" button once and the LCD will display the duty cycle. To change the duty cycle, press the "Backspace" button until the numbers are removed. Then using the keypad put in the percent of duty cycle you want to use. Then press the "Enter" button and the instrument will save the new setting and write it to memory. In order to change back to the 90% duty cycle, repeat the above instructions.



Press the Period "(●)" button to display the duty cycle.



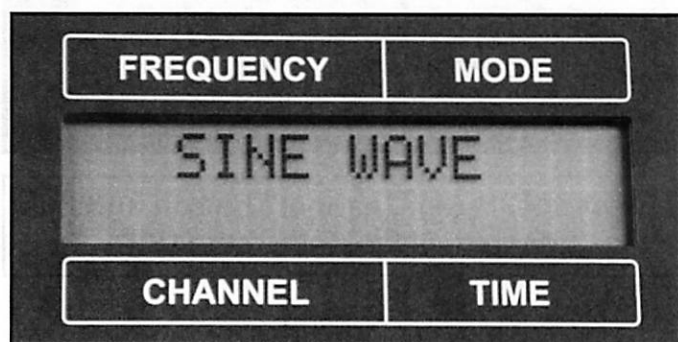
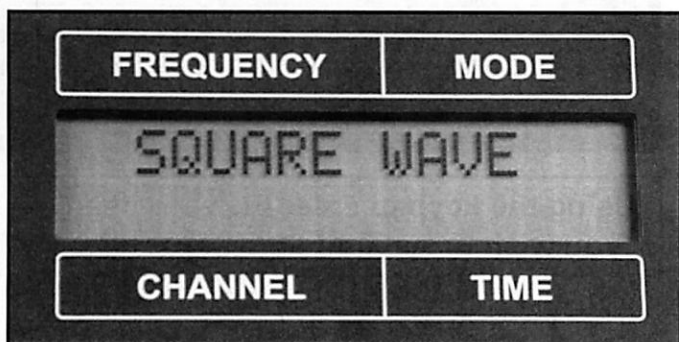
Press the "Backspace" button to remove the current duty cycle.



Use the keypad to enter the duty cycle you want to use and then press "Enter."

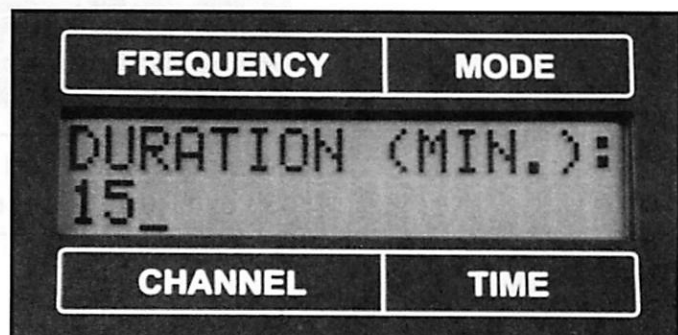
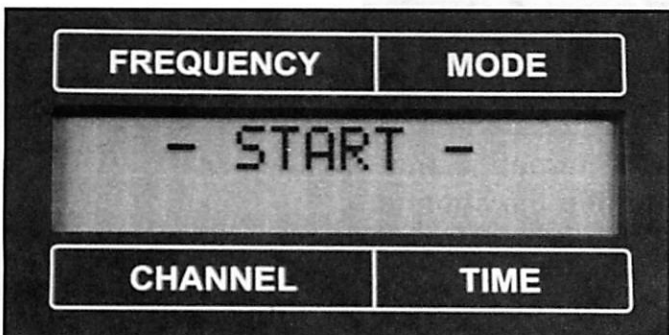
Checking or Changing from Square wave to Sine Wave

The "GB-4000" comes set in the default "Square Wave" mode. To check or change the wave form mode, the instrument has to be on but not running any selected channel or frequency. Push the "Sine/Square" button once, and the LCD will display the current wave form mode. To change the wave form mode, press the "Sine/Square" button once for the display and then immediately press the "Sine/Square" button again and it will change to the sine wave mode. *(Please note that the instrument will not change to the new mode until the words go off the LCD).* To change back to the square wave mode repeat the above instructions.



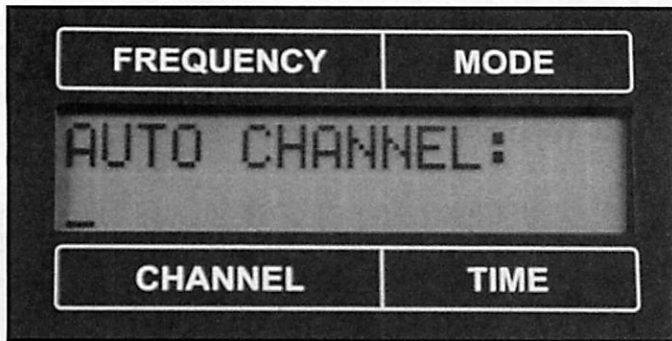
Changing The Run Time

The "GB-4000" has a default 5 minute run time for frequencies or your custom auto-channels. If you want to change the default run time the instrument has to be on but not running any selected channel or frequency. With the LCD displaying "START" use the keypad to choose the amount of time you want. The LCD will now display the amount of time you have chosen. Next either press the "Enter" button to run an individual frequency or press the "Auto-Channel" button to run an auto-channel that you have programmed into the instrument. *(Please note that the instrument has a maximum run time of 4 hours or 240 minutes).*



Running A Custom Programmed Auto Channel

To run a custom programmed auto channel, the instrument has to be on but not running any selected channel or frequency. Press the “Auto-Channel” button. Then using the keypad, enter the channel (1 to 2000) that you have previously programmed and want to run. Then press the “Run” button. The instrument will then run the auto channel you have chosen.



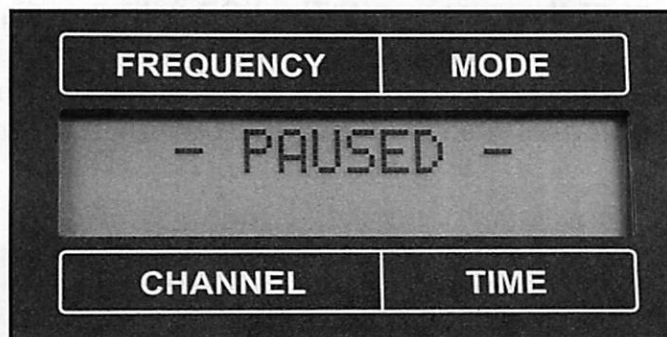
Press the “Auto Channel” button and this screen will appear on the LCD.



Using the keypad enter the auto channel you wish to run and then press “Run.”

How To Pause a Channel

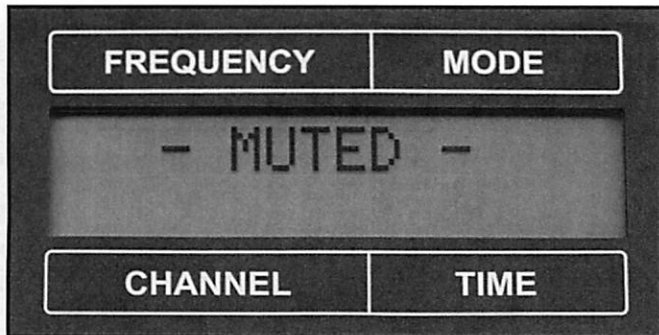
To pause a channel, the instrument has to be on and running any selected channel or frequency. Press the number “5” button on the keypad and the instrument will pause that channel. To start it running again all you have to do is press the “5” button or “Run” on the keypad.



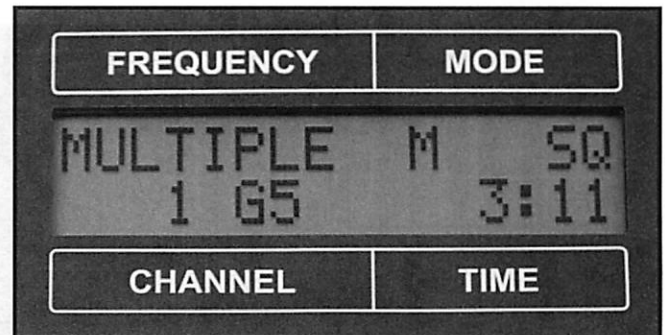
Using the keypad press “5” to pause and “5” or “Run” to resume running the channel.

How to Mute the Beeper

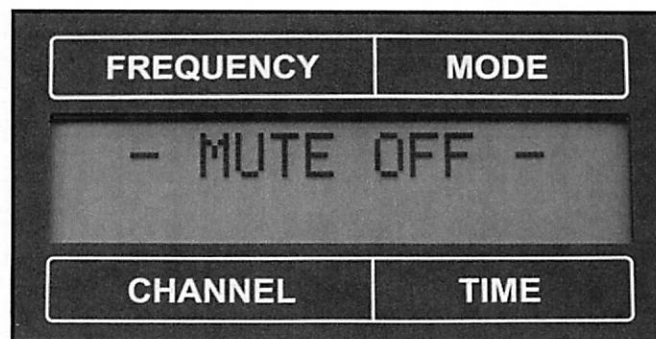
To mute the "Beeper" the instrument has to be running a selected channel or frequency. Press the number "4" button. The LCD will display "MUTED." The beeper will now be muted until the channel has finished running. To turn the beeper back on press the number "4" button again and the beeper will be turned back on.



Using the keypad press the "4" button to "Mute" or turn the beeper off.



An "M" will display in the LCD indicating that the beeper has been Muted.



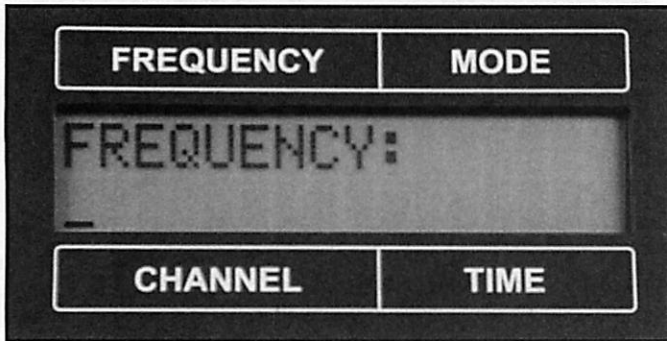
Using the keypad press the "4" button again to turn the beeper back on.

How to Skip a Frequency Group or Frequency

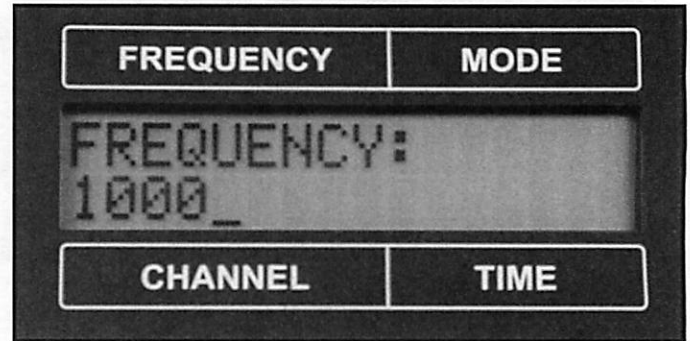
Sometimes you have to quite running a channel in the middle of using it. When you come back you do not want to run all the frequencies or groups of frequencies again. The "Skip" feature allows you skip down to the frequency or group of frequencies you were running and start with the frequency or group of frequencies that you were not able to finish running. To use the "Skip" feature start the channel running that you were using then press the number "6" button until you get to the frequency or group of frequencies you want to start running. The instrument will then start at that point and finish the channel you were running.

Running an Individual Frequency

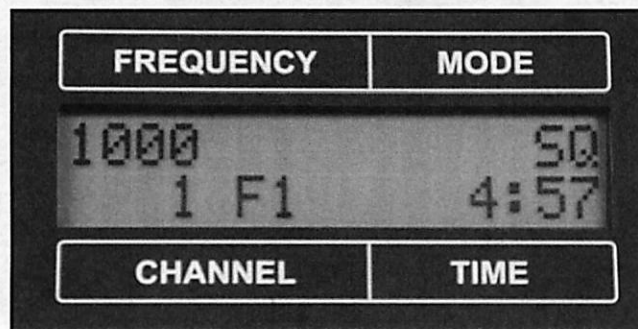
To run an individual frequency with the GB-4000 the instrument has to be on but not running any selected channel or frequency. Press the "Enter" button and then using the keypad enter the frequency that you want to run. Then press the "Run" button. The instrument will then run the frequency you have chosen.



Press the "Enter" button and this screen will appear on the LCD.



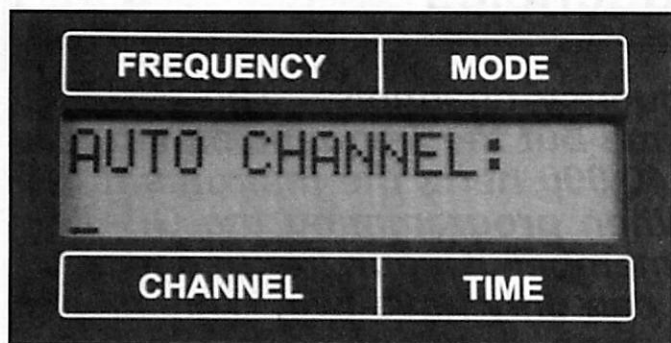
Using the keypad enter the frequency you want to run.



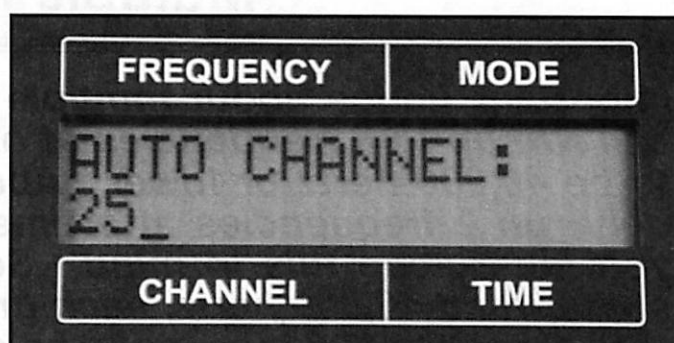
Press the "Run" button and the instrument will run the frequency you have chosen.

Creating A Custom Channel Using Individual Frequencies

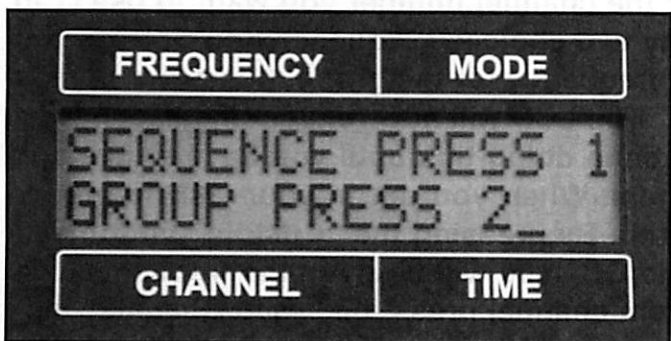
To create a custom channel using individual frequencies, the instrument has to be on but not running any selected channel or frequency. Press the "Custom" button. The LCD will display auto channel. Using the keypad enter the channel number you want to use (1 to 2000) and then press "Enter." The LCD will display two choices (Sequence and Group): you will choose #1. The LCD will now request your first frequency. Using the keypad put in your first frequency and then press "Enter." The LCD will now request your second frequency. Put it in and press "Enter." You will continue doing this until you have entered all the frequencies you want to use up to 48 maximum. When you put in your last frequency DO NOT PRESS ENTER, press the "Custom" button. By pressing the "Custom" button you close the auto channel and save it to memory. To run your new custom channel press the "Auto Channel" button and enter the number of the channel that you have just programmed and then press Run. Your new channel will now run. *Please note, if you only want to put a few frequencies into each group you can use the plus (+) button to move from one group to another group.*



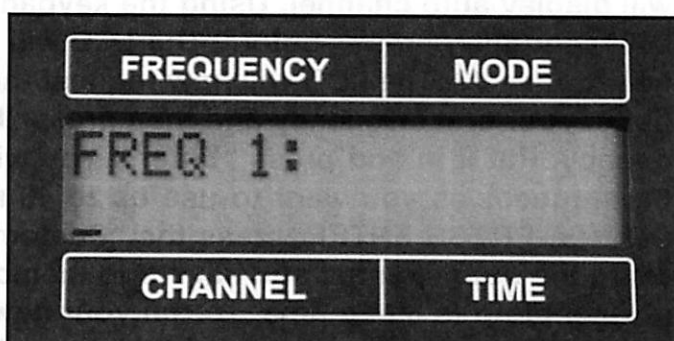
Press the "Custom" button and this screen will appear on the LCD.



Using the keypad enter the number of the auto channel you want to program and then press "Enter."



Press #1 for programming an individual frequency channel.



This screen will appear on the LCD.

Instructions continued on next page.

FREQUENCY	MODE
FREQ 1: 1250_	
CHANNEL	TIME

Use the keypad and put in your first frequency and press "Enter."

FREQUENCY	MODE
FREQ 2: 456_	
CHANNEL	TIME

Use the keypad and enter your second frequency. Continue doing this until you have put in your last frequency. After your last frequency DO NOT PRESS ENTER, press the "Custom" button.

Creating A Custom Channel Running Multiple Frequencies

Important notice about multiple frequency channels: The GB-4000 can run up to 8 frequencies at one time but the frequencies all have to be 40,000 hertz or lower. Above 40,000 hertz the instrument can only run 2 frequencies at a time. When programming the GB-4000 you must keep this in mind. So remember if your frequencies are higher than 40,000 hertz, each group can only have two. This means that the GB-4000 can only hold 12 high frequencies per channel rather than the 48 low frequencies per channel.

To create a custom channel that will run multiple frequencies, the instrument has to be on but not running any selected channel or frequency. Press the "Custom" button. The LCD will display auto channel. Using the keypad enter the channel number you want to use (1 to 2000) and then press "Enter." The LCD will display two choices (Sequence and Group): you will choose #2. The LCD will now request the first frequency for the group. Using the keypad put in your first frequency and then press "Enter." The LCD will now request the second frequency. Put it in and press "Enter." You will continue doing this until you have entered all the frequencies you want to use up to 48 maximum. When you put in your last frequency DO NOT PRESS ENTER, press the "Custom" button. By pressing the "Custom" button you close the auto channel and save it to memory. The GB-4000 will now run the frequencies in groups of up to 8 at a time. To run your new custom channel press the "Auto Channel" button and enter the number of the channel that you have just programmed and then press "Run." Your new channel will now run. *Please note, if you only want to put a few frequencies into each group you can use the plus (+) button to move from one group to another group.*

Instructions continued on next page.

FREQUENCY	MODE
AUTO CHANNEL: _	
CHANNEL	TIME

Press the "Custom" button and this screen will appear on the LCD.

FREQUENCY	MODE
AUTO CHANNEL: 30_	
CHANNEL	TIME

Using the keypad enter the number of the auto channel you want to program and then press "Enter."

FREQUENCY	MODE
SEQUENCE PRESS 1 GROUP PRESS 2_	
CHANNEL	TIME

Press #2 for programming a multiple frequency channel.

FREQUENCY	MODE
GROUP 1, FREQ 1: _	
CHANNEL	TIME

This screen will appear on the LCD.

FREQUENCY	MODE
GROUP 1, FREQ 1: 1000_	
CHANNEL	TIME

Use the keypad and put in your first frequency and press "Enter."

FREQUENCY	MODE
GROUP 1, FREQ 2: 2330_	
CHANNEL	TIME

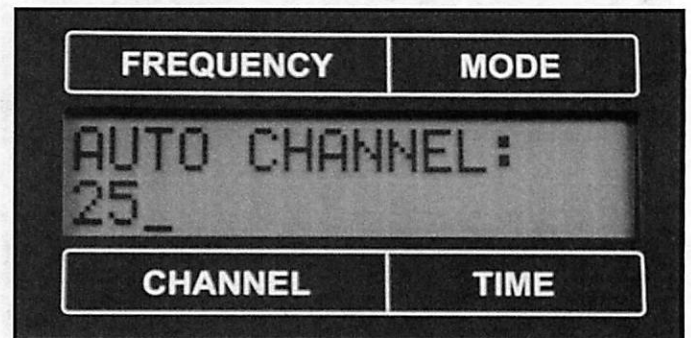
Use the keypad and enter your second frequency. Continue doing this until you have put in your last frequency. After your last frequency DO NOT PRESS ENTER, press the "Custom" button.

Running Multiple Auto Channels

The GB-4000 has the ability to run up to 10 auto-channels of your choice one right after another. This is very advantageous when you have several tests to do but do not want to enter and run them one at a time. To do this, the instrument has to be on but not running any selected channel or frequency. Press the "Auto Channel" button and enter the number of the first auto channel you want to run. Then press the "+/%MOD" button. The LCD will ask for the next auto channel you want to run. Continue entering the channels you want to run up to a maximum of 10, pushing the "+/%MOD" button after each number you enter. After you have put in the last auto channel you want to run press "Run." The instrument will now run the several auto channels you have selected in the order that you entered them.



Press the "Auto Channel" button and this screen will appear on the LCD.



Using the keypad enter the number of the first auto channel you wish run. Then press the "+/%MOD" button.



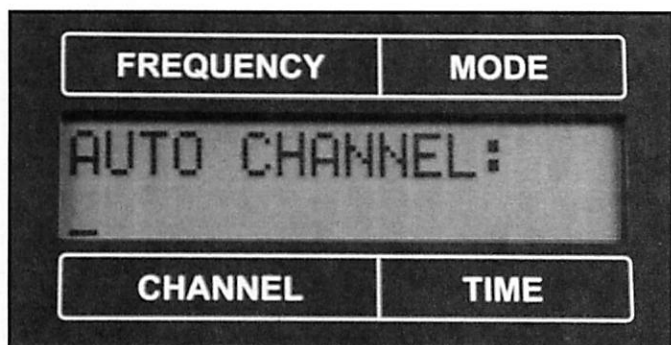
Enter the number of the next auto channel you want to run and press the "+/%MOD" button.



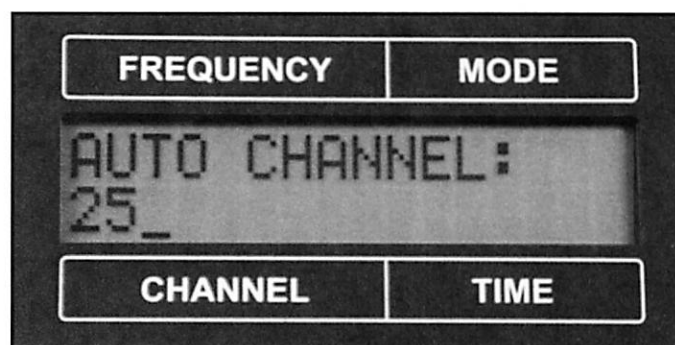
Enter the number of the next auto Channel you want to run and continue doing this until you have put your last one in. Then press "Run."

Changing A Frequency Within A Custom Channel

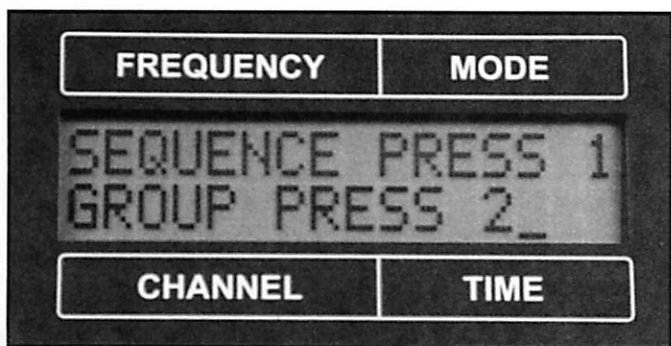
To change a frequency in a custom channel, the instrument has to be on but not running any selected channel or frequency. Press the "Custom" button. The LCD will display Auto Channel. Using the keypad enter the number of the auto channel containing the frequency you want to change. The LCD will display two choices (Sequence and Group): you will choose the number #1 or #2 according to the type of channel it is. The LCD will now show you your first frequency. Press the "Enter" button and continue pressing the "Enter" button until you come to the frequency you want to change. Press "Backspace" to remove the frequency. Then use the keypad to enter in the new frequency. After you have put in the new frequency DO NOT PUSH ENTER. Press the "Custom" button. By pressing the "Custom" button you close the auto channel and save it to memory. Your custom auto channel has now been updated and the new frequency has replaced the old one.



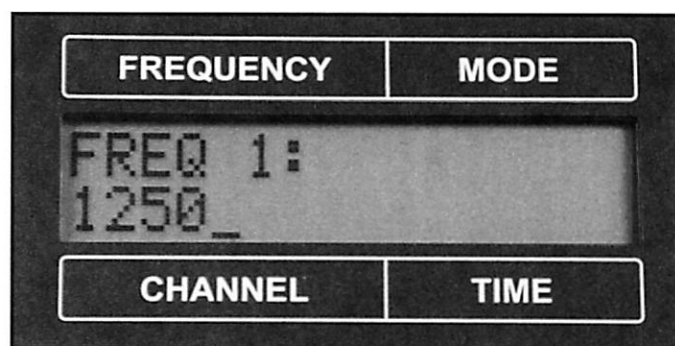
Press the "Custom" button and this screen will appear on the LCD.



Using the keypad enter the number of the auto channel containing the frequency you want to change and press "Enter."



Press #1 or #2 for the type of channel it is.



This screen will appear on the LCD. Continue pressing "Enter" until you come to the frequency you want to change.

Instructions continued on next page.

FREQUENCY	MODE
FREQ 1: _	
CHANNEL	TIME

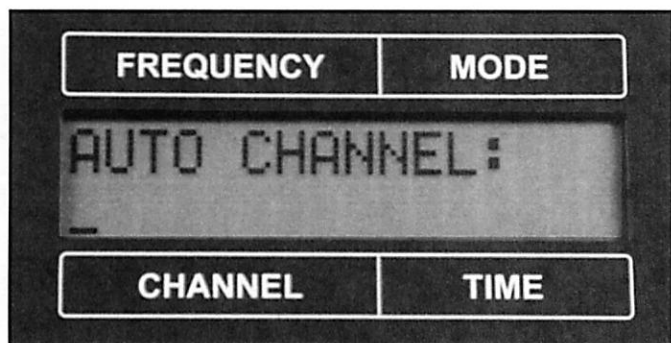
Press "Backspace" to remove the frequency you want to change.

FREQUENCY	MODE
FREQ 1: 1365_	
CHANNEL	TIME

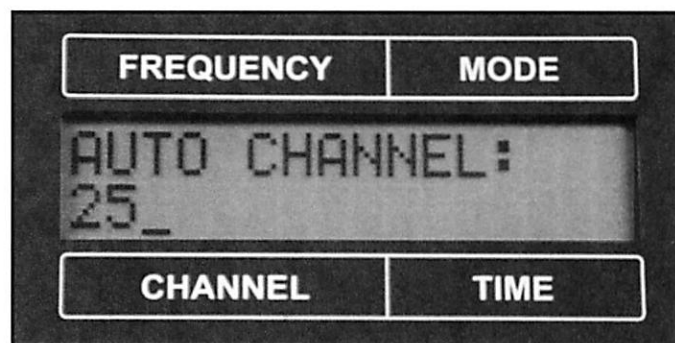
Using the keypad enter in the new frequency you want to use. After you have put in the new frequency **DO NOT PRESS ENTER**, press the "Custom" button.

Adding A Frequency To A Custom Channel

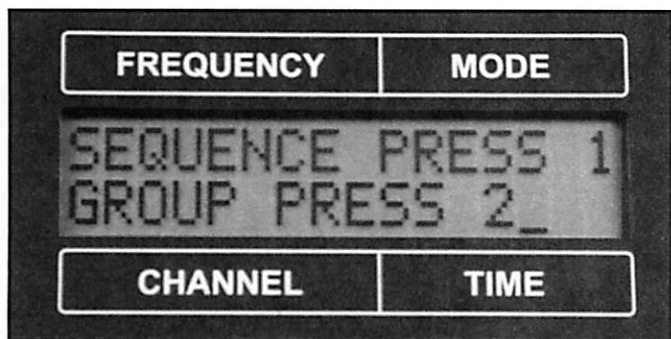
To add a frequency to a custom channel, the instrument has to be on but not running any selected channel or frequency. Press the "Custom" button. The LCD will display Auto Channel. Using the keypad enter the channel number you want to add a frequency to and press the "Enter" button. The LCD will display two choices (Sequence and Group): you will choose the number #1 or #2 according to the type of channel it is. The LCD will now show you your first frequency. Press "Enter" and continue pressing the "Enter" button until you come to the end of the frequencies that are in the channel. After the last frequency there will be an empty frequency screen. Then use the keypad to enter the new frequency you want to add. After you have put in the new frequency **DO NOT PUSH ENTER**, press the "Custom" button. By pressing the "Custom" button you close the auto channel and save it to memory. Your custom auto channel has now been updated with the new frequency.



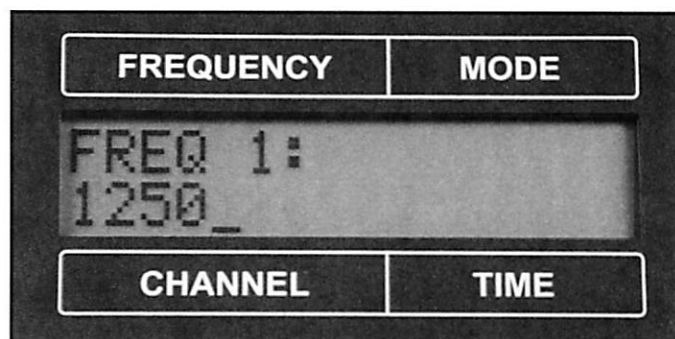
Press the "Custom" button and this screen will appear on the LCD.



Using the keypad enter the number of the auto channel you wish change the frequency in and press "Enter."



Press #1 or #2 for the type of channel it is.



This screen will appear on the LCD. Continue pressing "Enter" until you come to the end of the frequencies in the channel.

Instructions continued on next page.

FREQUENCY	MODE
FREQ 6: _	
CHANNEL	TIME

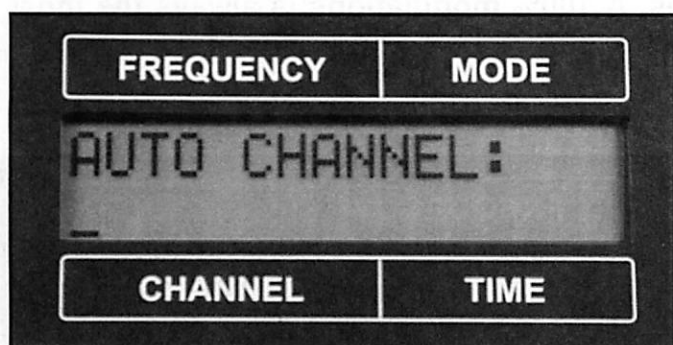
This is what the empty frequency screen will look like.

FREQUENCY	MODE
FREQ 6: 10000_	
CHANNEL	TIME

Using the keypad enter the new frequency you want to add. After you have added in the new frequency **DO NOT PRESS ENTER**, press the "Custom" button.

Deleting A Custom Channel

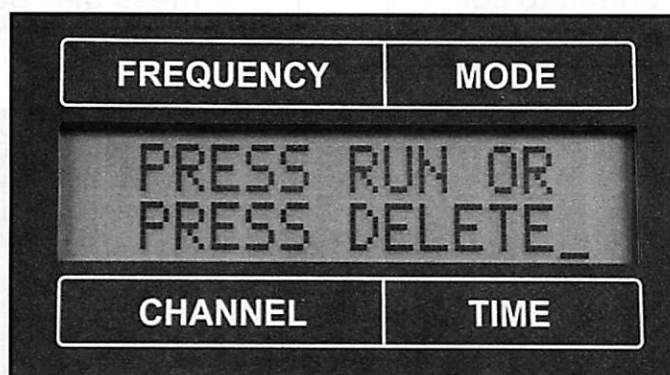
To delete a Custom Channel, the instrument has to be on but not running any selected channel or frequency. Press the "Auto Channel" button. The LCD will display Auto Channel. Using the keypad enter the channel number you want to delete and press the "Enter" button. The LCD will now give two choices (Press "Run" or Press "Delete"). Press the "Delete" button on the keypad. The custom channel will now be deleted. *Caution; make sure before you press delete that you have the correct channel you want to delete because once you push delete it will be removed and you will have to put it back with the software or by using the keypad.*



Press the "Auto Channel" button and this screen will appear on the LCD.



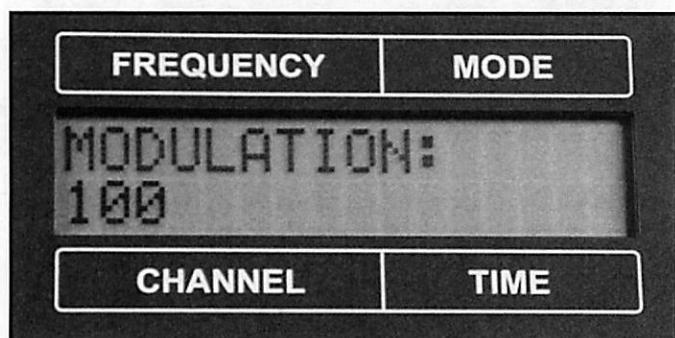
Using the keypad enter the number of the Auto Channel you want to delete and press the "Enter" button.



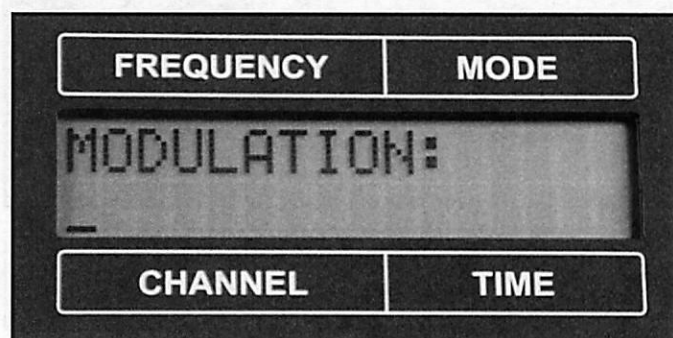
The LCD will display this screen and give you the option to press the "Delete" button. This will delete the Auto Channel.

Checking or Changing the Modulation

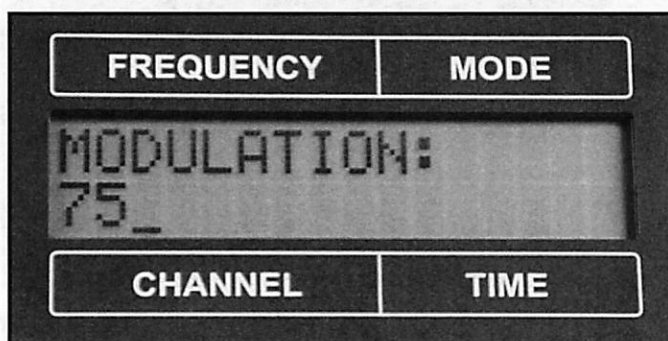
The "GB-4000" comes with the ability to change the modulation percent from 10% to 90%. To change the modulation the instrument has to be turned on but not running any selected channel or frequency. Press the "+/%Mod" button. To change the percent of modulation press the "Backspace" button until the numbers are removed. Then using the keypad put in the new percent you want to use. Then press "Enter." It will then save your new settings. The user should keep in mind that the lower the % of modulation the lower the power output of the modulated frequency or frequencies. The higher the % of modulation the greater the power of the modulated frequency or frequencies. A 100% modulations is always the most powerful.



Press the "+/%MOD" button to get this screen.



Press the "Backspace" button.



Enter the new percent you want to use and press the "Enter" button.

How to Use the Sweep Capability

The "GB-4000" comes with the ability to sweep or to do a convergence sweep through hundreds or millions of frequencies over a pre-set time of your choosing. To set the "Sweep", the instrument has to be turned on but not running any selected channel or frequency. Press the "Sweep" button and the LCD screen will ask for the "Start Frequency". Use the keypad to enter the frequency you want to start with and then press "Enter." The LCD screen will then ask for the "End Frequency." Use the keypad to enter the frequency you want to end with and then press "Enter." You will have to choose either to run a Sweep or a "Convergence Sweep." Press #1 to run a regular Sweep or press #2 to run a Convergence Sweep. The instrument will now sweep through the range of frequencies that you have chosen. If you want to change the time from the default time of 5 minutes and don't know how to do this then go to "Changing the run time" on page 11. *Below are the definitions of a Sweep and a Convergence sweep.*

SWEEP: The sweep feature allows you to run a specified frequency range of your choosing, one frequency at a time. The instrument sweeps from your beginning frequency to the ending frequency you chose.

CONVERGENCE SWEEP: The convergence sweep feature allows you to run two frequencies at a time over a specified frequency range of your choosing. How this works is, the instrument sweeps from your "Start Frequency" to the "End Frequency" and at the same time it sweeps the "Ending Frequency" to the "Start Frequency." This makes it so the two frequencies go towards each other, then pass each other, one going up and the other going down and each ending where the other frequency began.

FREQUENCY	MODE
START FREQUENCY:	
CHANNEL	TIME

Enter the frequency you want to start with and then press "Enter."

FREQUENCY	MODE
SWEEP PRESS 1 OR CONVERGE PRESS 2	
CHANNEL	TIME

FREQUENCY	MODE
END FREQUENCY:	
CHANNEL	TIME

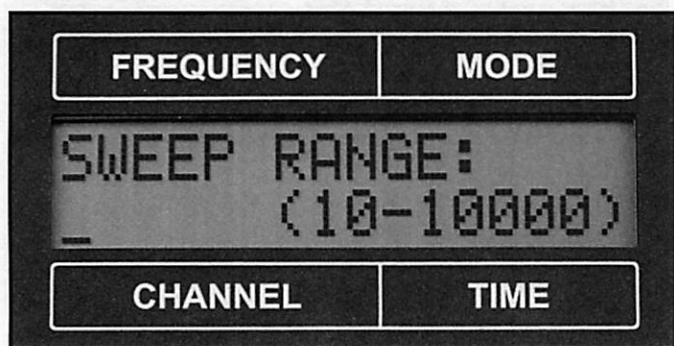
"Enter the frequency you want to end with and then press "Enter."

To run a regular "Sweep" press #1.
To run a "Convergence Sweep" press #2.
The instrument will then run the sweep you have chosen.

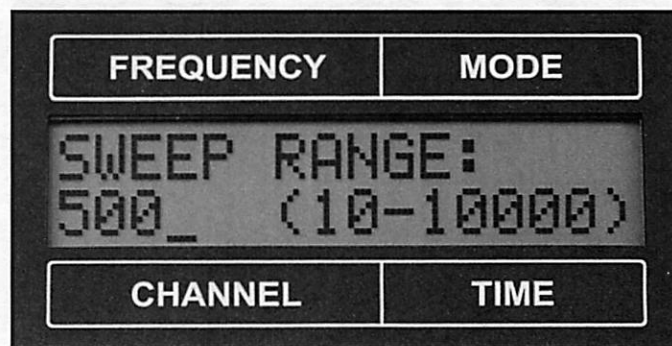
How to Use the Channel Sweep Capability

The "GB-4000" comes with the ability to do a "Channel Sweep." This feature works with all programmed auto channels and any individual frequency that may be run. The "Channel Sweep" feature allows the user the ability to sweep all frequencies within a channel from 10 Hertz to 10000 Hertz for the duration time that the auto channel is run. The "Channel Sweep" feature works in this manner. If you have a frequency in a channel of 1000 Hertz and you decide you want to use a 500 Hertz "Channel Sweep" then the "Channel Sweep" will start at 750 Hertz and end at 1250 Hertz. The "Channel Sweep" feature always splits the sweep range so that 50% of the sweep starts below the targeted frequency and 50% goes above the targeted frequency. If there are several frequencies being run simultaneously then all frequencies are swept simultaneously in this same manner. To use the "Channel Sweep" feature you press the "Channel Sweep" button. Then enter any frequency between 10 Hertz to 10000 Hertz. Then press the "Enter" button. Then press the "Auto Channel" button and enter the Auto Channel number you want to use. Then press the "Run" button.

If you want to run the "Channel Sweep" for longer than the GB-4000's default 5 minute run time you must do the following. After you press the "Channel Sweep" button and enter the frequency you want to use and have pressed the "Enter" button then you need to change the run time. If you want the new run time to be for 20 minutes then do the following. The LCD must have "Start" displayed on it. Press 20 using the keypad. The LCD will display a 20 minute duration time. Then press the "Auto Channel" button and enter the channel number you want to run. If you want to run a frequency rather than an auto channel then press the "Enter" button and using the keypad enter the frequency you want to use and press the "Run" button.



Press the "Channel Sweep" button and this screen will appear on the LCD.



Using the keypad enter any frequency range you want to use and press "Enter."

How to Use the Gating Features

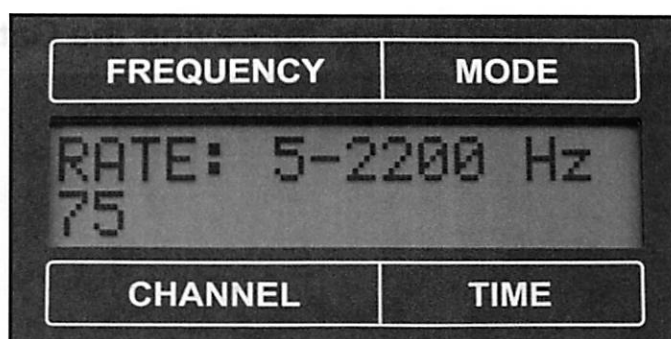
The "GB-4000" comes with the Gate turned off. There are two ways to turn on the Gate. #1: The instrument has to be turned on but not running any selected channel or frequency. Press the "Gate" button and press #1 on the keypad and it will turn on the Gate and go back "Start". The Gate is now turned on and a "G" will be displayed on the LCD when you are running a channel or frequency. The second way to turn it on is, after the instrument starts running a frequency or a channel press the gate button and the gate will turn on.

To change the Gate rate press the "Gate" button again. Then press #3. To change the rate from the current rate to a new rate (5 Hz to 2200 Hz) press the "Backspace" button until the numbers are removed. Then using the keypad put in the rate you want to use. Then press the "Enter" button. You will now be taken to a new screen that has the Duty Cycle of the Gate. To change the Duty Cycle of the Gate press the "Backspace" button until the numbers are removed. Then using the keypad put in the new Duty Cycle you want to use. Then press the "Enter" button and your new settings will be saved.

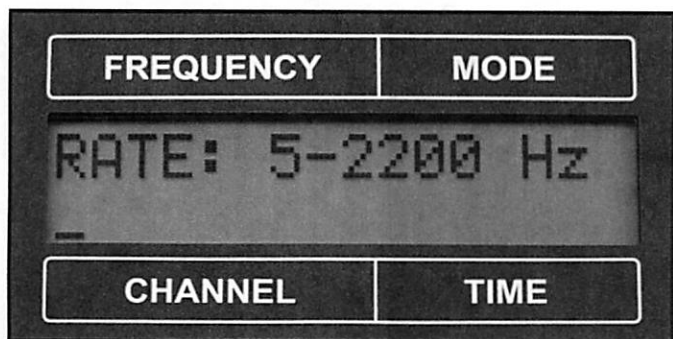
The "GB-4000" can save the Gate "Turned On" in any channel so that you do not have to turn it on for channels that you may use regularly. To save the Gate "Turned On" in any channel press #4. Then enter the channel number you want the Gate "Turn On" in and the press "Enter." To turn the "Gate Off" for the same channel repeat the same steps which turned the Gate on for that channel.



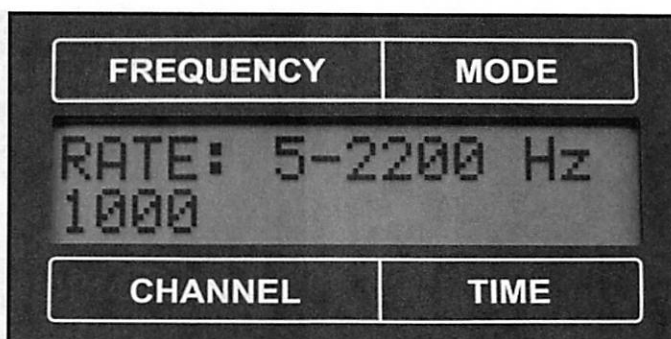
Turn it on press #1. Turn it off press #2.
To change the Gate Rate press #3



After pressing #3 the LCD will show
this screen.



Press the "Backspace" button.



To Change to the new Rate press "Enter."

Instructions continued on next page.

FREQUENCY	MODE
DUTYCYCLE: 10-90 90	
CHANNEL	TIME

You will now set the Gate Duty Cycle.

FREQUENCY	MODE
DUTYCYCLE: 10-90	
CHANNEL	TIME

Press the "Backspace" button.

FREQUENCY	MODE
DUTYCYCLE: 10-90 50	
CHANNEL	TIME

Change to the new Gate Duty Cycle and press the "Enter" button.

Instructions for saving the Gate "Turned On" in an auto channel.

FREQUENCY	MODE
GATE: ON:1, OFF:2 RATE:3, CHANNEL:4	
CHANNEL	TIME

Press # 4 to turn on Gate in any channel.

FREQUENCY	MODE
AUTO CHANNEL:	
CHANNEL	TIME

The LCD will display this screen.

FREQUENCY	MODE
AUTO CHANNEL: 175_	
CHANNEL	TIME

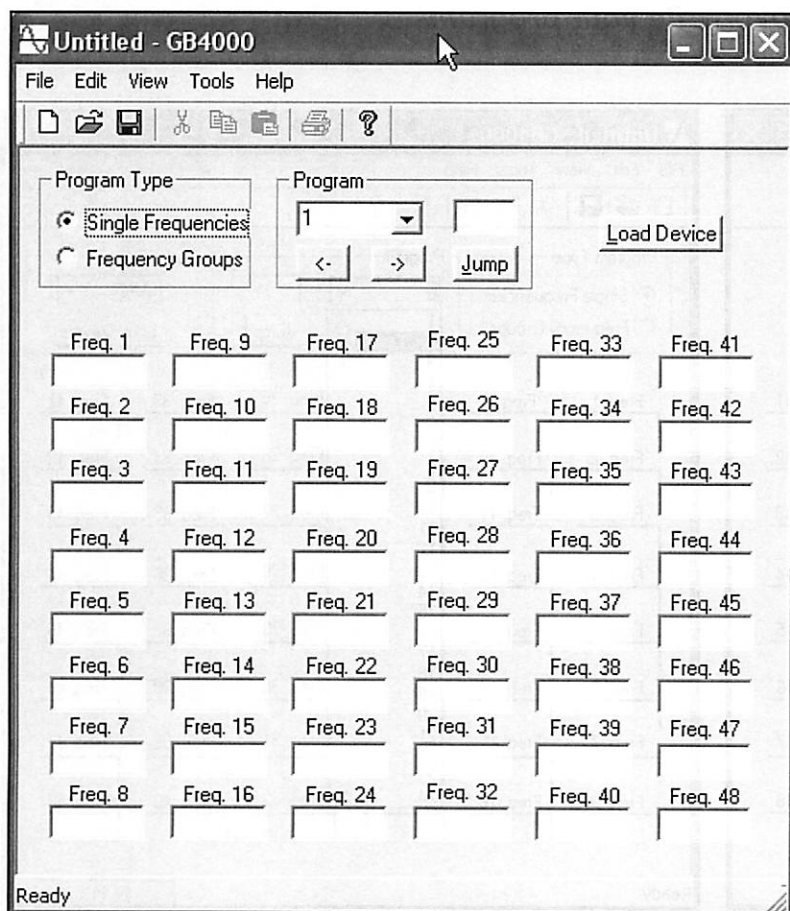
Put in the channel number you want the Gate "Turned On" in and press "Enter."

GB-4000 Programming Software

The "GB-4000" comes with software that makes it so you can program the instrument from your computer. The software is very easy to use. All you do is put our CD into your CD Rom and copy and paste the "GB4000 Programming Software" file to your hard drive. Then copy and paste the "GB4000" program icon to your desktop. A photo of the program icon is shown below . Double-click on the icon and the program will open.

IMPORTANT NOTICE: Before programming or reloading the programs that you may have into the GB-4000 make sure that you open the GB4000.gb file. To do this just double click on the yellow folder in the task bar and then when the widow opens double click on the GB4000.gb file. This will load all the programmed channels into the software. You will know that the GB4000.gb file is loaded correctly when there are frequencies loaded into the software.

WARNING: If there are already programs loaded into the software make sure that you start your new programs in an empty channel.



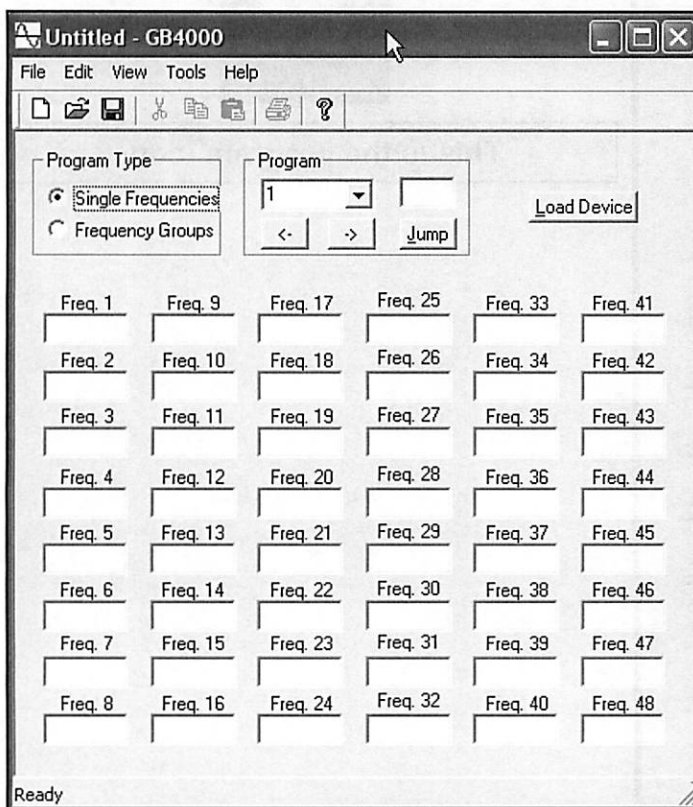
This is the program icon.

This is what the GB-4000 program looks like.
You will load your frequencies into this program.

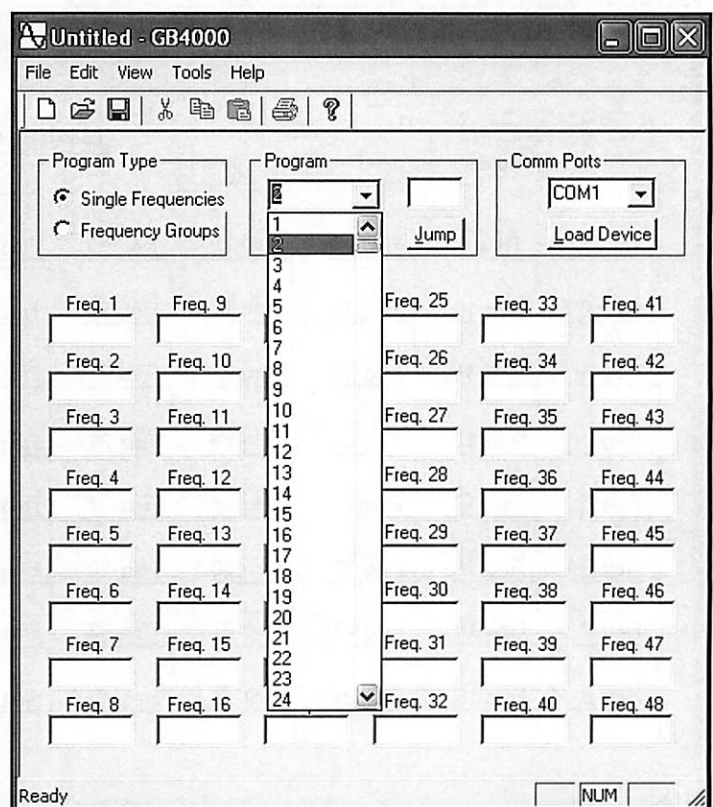
Programming A Single Frequency Channel With The Software

The GB-4000 can run up to 48 frequencies from 1 Hertz to 20 million Hertz one right after another in a single frequency channel. Before you begin entering frequencies you need to choose, under "Program Type", a single frequency channel. You will notice that the single frequency programming screen (shown below on the left) gives you 48 frequencies.

The next thing you need to know is how many frequencies you want to program in and what channel number you want to use. Make sure that you choose a program number that is empty. There are 2000 programmable channels for your use. To start programming the software choose the channel program number you are going to use. To do this click on the "Program" arrow with your mouse. A window (shown below on the right) will open up so that you can move the bar up or down and choose the program number you want to use. If the number is high you can put the channel number in the window above the word "Jump", then click on Jump and it will go to that channel for programming. **Another WARNING: make sure that you have opened the GB4000.gb file and loaded the frequencies in that file into the programming software, first, or you may overwrite your programs.**



This is the single frequency screen.



Choose the program channel number.

Instructions continued on next page.

To program the channel number with frequencies all you have to do is click on the first frequency window with your mouse. The cursor will begin flashing on and off. Enter your first frequency and then using the "Tab" button on your computer keyboard, advance to the next frequency and enter it in. Continue doing this until you have entered in all of the desired frequencies. You may want to go from the lowest frequency to the highest when entering them in but it really does not matter what order they are put in. Also be aware that you can only go to 1 decimal point. For an example you can put in 906.1 but not 906.11. You should round up or round down frequencies that have two or three decimal points.

Untitled.gb - GB4000

File Edit View Tools Help

Program Type

☒ Single Frequencies

☐ Frequency Groups

Program

1

<- -> Jump

Load Device

Freq. 1 452.0	Freq. 9 1220000.	Freq. 17	Freq. 25	Freq. 33	Freq. 41
Freq. 2 888.0	Freq. 10 1670000.	Freq. 18	Freq. 26	Freq. 34	Freq. 42
Freq. 3 2005.5	Freq. 11 1800000.	Freq. 19	Freq. 27	Freq. 35	Freq. 43
Freq. 4 3085.0	Freq. 12 2225000.	Freq. 20	Freq. 28	Freq. 36	Freq. 44
Freq. 5 21270.3	Freq. 13 2777056.	Freq. 21	Freq. 29	Freq. 37	Freq. 45
Freq. 6 35444.0	Freq. 14 8581333.	Freq. 22	Freq. 30	Freq. 38	Freq. 46
Freq. 7 27045.0	Freq. 15 11780500	Freq. 23	Freq. 31	Freq. 39	Freq. 47
Freq. 8 30000.0	Freq. 16	Freq. 24	Freq. 32	Freq. 40	Freq. 48

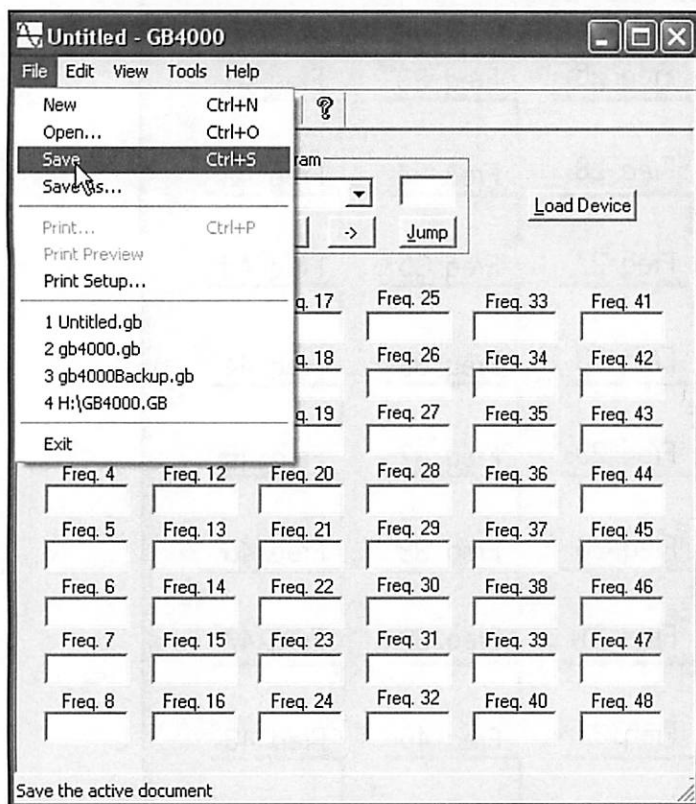
Ready

Enter the desired frequencies.

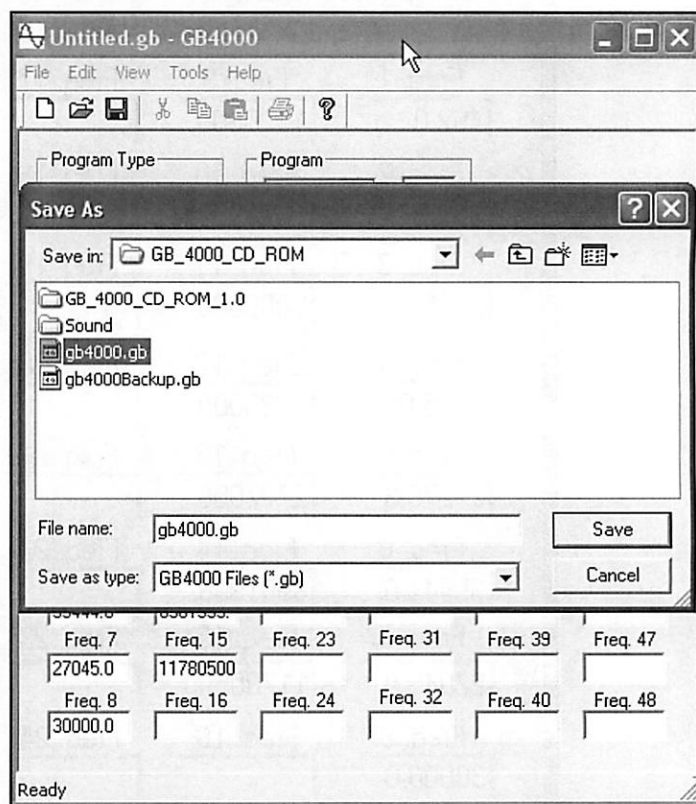
Instructions continued on next page.

Before you program any frequencies into the software you may want to put your new frequency program into the already existing GB4000.gb file so that you save your new program or programs with the existing programs that have already been programmed into the software. If this is what you want to do then make sure that you open the existing GB4000.gb file that is on the CD before you start programming any new programs. Please keep in mind that you will have to save the new GB4000.gb file on your computer since you cannot write back to the CD. Many people copy the complete contents of the CD onto their computer so that the software is on their computer rather than being on the CD. This makes it easier to save the programs that you create. The CD will always have a backup file of the original GB4000.gb file just in case you lose or corrupt the one on your computer.

Once you have created your new frequency program you will need to save it. To do this click on "File" and choose "Save" (shown below on left). The next screen (shown below on right) will give you the choice of where to save the file. We suggest that you save it in the "GB4000 Program Software" file folder. You can save the file over the existing GB4000.gb file. This will make it so that all the existing programs and the new programs that you create will all be in the same file. To save it just click on the "GB4000.gb" file and then click on the "Save" button.



Click on "File" and then click on "Save."

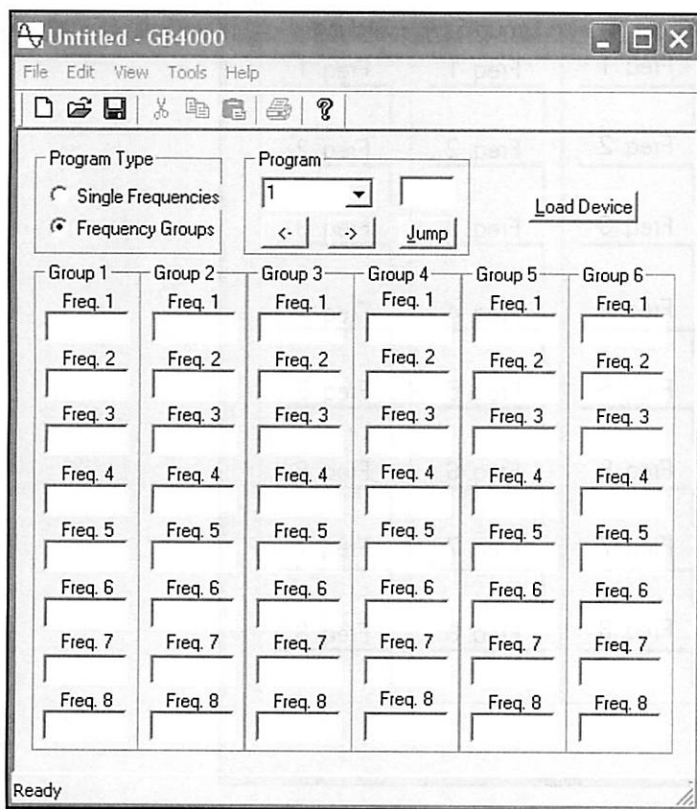


Choose the "GB4000.gb" file and click "Save."

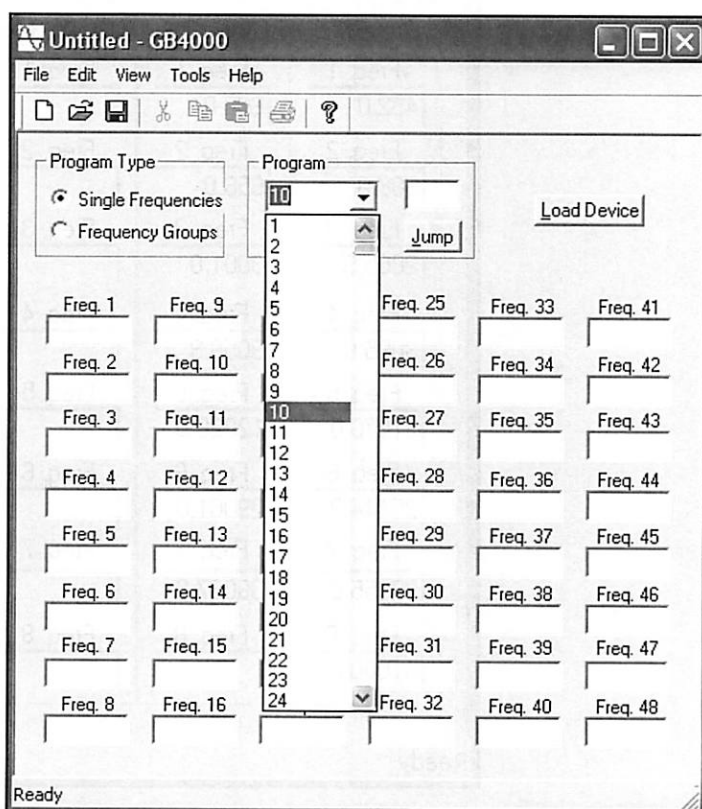
Programming A Multiple Low Frequency Channel With The Software

The GB-4000 can run up to 8 frequencies 40,000 hertz or lower, simultaneously. Before you begin entering frequencies you need to choose a multiple frequency channel under "Program Type". Click on "Frequency Groups" to create a multiple frequency channel. You will notice that the screen (shown below on left) gives you 48 frequencies in 6 groups that hold 8 frequencies each.

The next thing you need to know is how many frequencies you want to program in and what channel number you want to use. There are 2000 programmable channels for your use. To start programming the software first choose the channel program number you are going to use. To do this click on the program arrow with your mouse. A window (shown below on right) will open up so that you can move the bar up or down and choose the program number you want. If the number is high you can put the channel number in the window above the word "Jump", then click on "Jump" and it will go to that channel for programming. **Another WARNING: make sure that you have opened the GB4000.gb file and loaded the frequencies in that file into the programming software, first, or you may overwrite your programs.**



This is the multi-frequency screen.



Choose the program channel number.

Instructions continued on next page.

Next, all you have to do to program the channel number with the frequencies is click on the first frequency window with your mouse. The cursor will begin flashing on and off. Enter your first frequency and then using the "Tab" button on your computer keyboard, advance to the next frequency and enter it in. Continue doing this until you have entered in all of the desired frequencies. To leave some spaces without frequencies just tab past them. If you have 18 frequencies to program in and you want to create a multiple frequency channel, you may want to put 6 frequencies in 3 groups rather than 8 frequencies in two groups and only 2 frequencies in the third group. If you decide that you want to change the channel that you programmed in to a single frequency channel, all you have to do is click on the single frequency program and it will change it without you having to re-enter the frequencies. You can also change it with the keypad of the instrument. *Remember if you have chosen a multiple frequency channel that will run several frequencies at once, the frequencies can not be higher than 40,000 Hertz.*

Untitled.gb - GB4000

File Edit View Tools Help

Program Type

☐ Single Frequencies

☒ Frequency Groups

Program

2

< >

Jump

Load Device

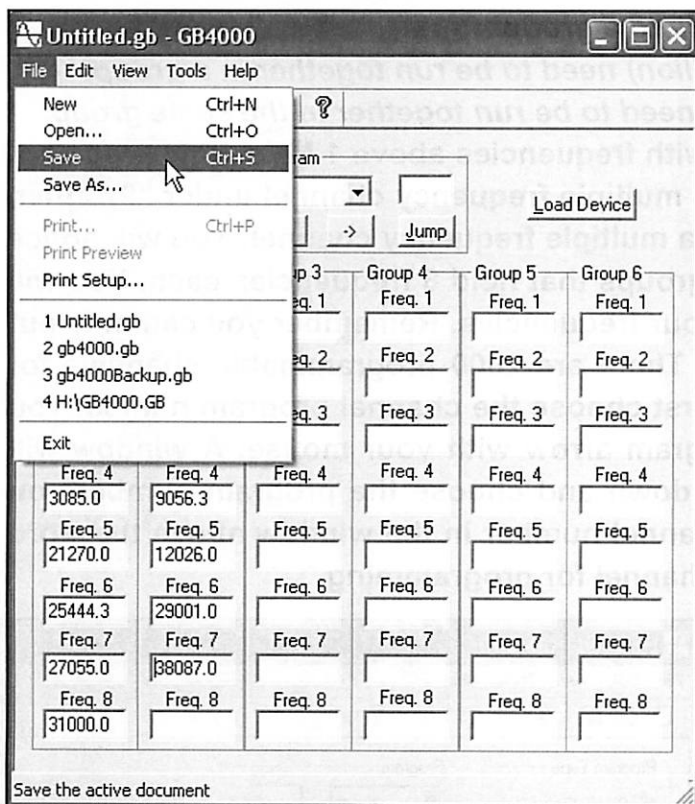
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Freq. 1	Freq. 1	Freq. 1	Freq. 1	Freq. 1	Freq. 1
452.0	600.0				
Freq. 2	Freq. 2	Freq. 2	Freq. 2	Freq. 2	Freq. 2
888.0	656.0				
Freq. 3	Freq. 3	Freq. 3	Freq. 3	Freq. 3	Freq. 3
2005.5	8001.0				
Freq. 4	Freq. 4	Freq. 4	Freq. 4	Freq. 4	Freq. 4
3085.0	9056.3				
Freq. 5	Freq. 5	Freq. 5	Freq. 5	Freq. 5	Freq. 5
21270.0	12026.0				
Freq. 6	Freq. 6	Freq. 6	Freq. 6	Freq. 6	Freq. 6
25444.3	29001.0				
Freq. 7	Freq. 7	Freq. 7	Freq. 7	Freq. 7	Freq. 7
27055.0	38087.0				
Freq. 8	Freq. 8	Freq. 8	Freq. 8	Freq. 8	Freq. 8
31000.0					

Ready

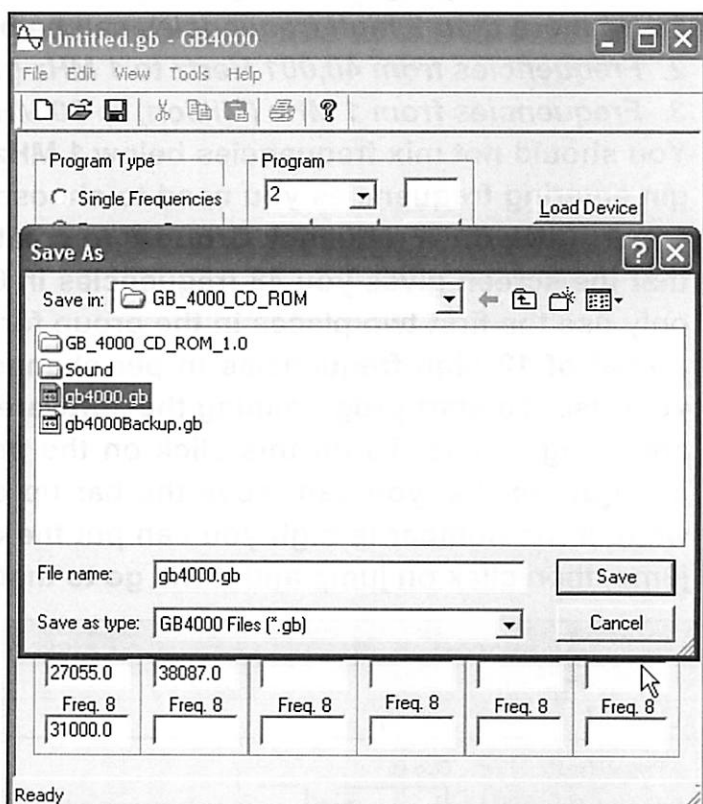
Enter the desired frequencies.

Instructions continued on next page.

Once you have created your new frequency program you will need to save it. To do this click on "File" and choose "Save" (shown below on left). The next screen (shown below on right) will give you the choice of where to save the file. We suggest that you save it in the "GB4000 Program Software" file folder. You can save the file over the existing GB4000.gb file. This will make it so that all the existing programs and the new programs that you create will all be in the same file. To save it just click on the "GB4000.gb" file and then click on the "Save" button.



Click on "File" and then click on "Save."



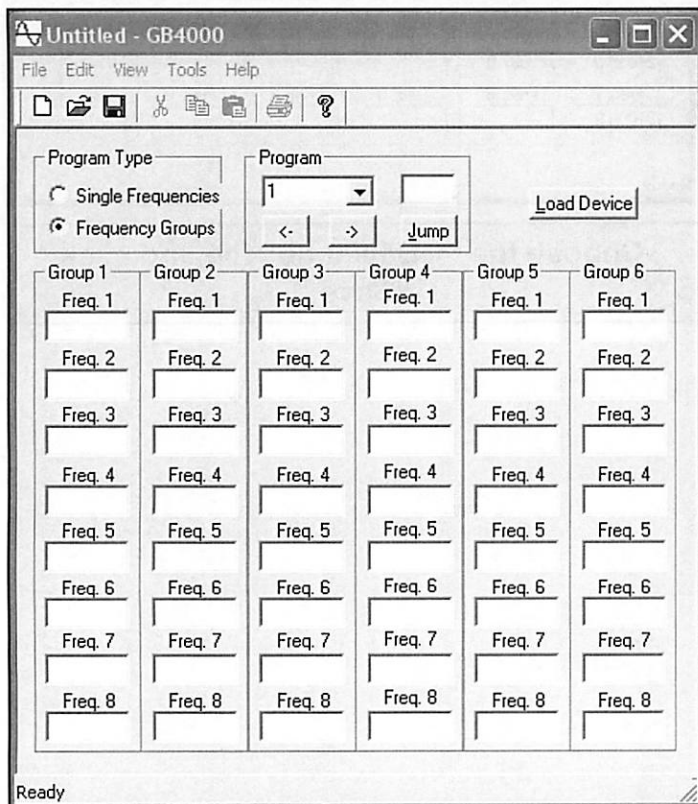
Choose the "GB4000.gb" file and click "Save."

Programming A Multiple High Frequency Channel With The Software

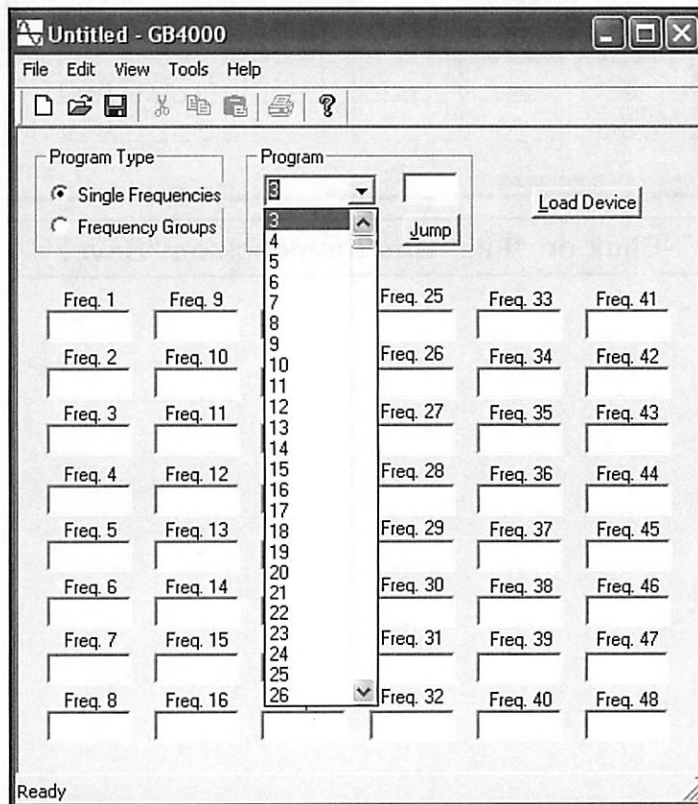
The GB-4000 can run 2 frequencies simultaneously from 40,001 Hertz to 20 million Hertz (20 MHz). This will allow you to program in 12 high frequencies into a multiple frequency channel. In order to program in high frequencies there are 3 rules that need to be followed.

1. No more than 2 high frequencies can be put into a group.
2. Frequencies from 40,001 Hertz to 1 MHz (million) need to be run together in a group.
3. Frequencies from 1 MHz (Million) to 20 MHz need to be run together in the same group.

You should not mix frequencies below 1 MHz with frequencies above 1 MHz. Before you begin entering frequencies you need to choose a multiple frequency channel under "Program Type". Click on "Frequency Groups" to create a multiple frequency channel. You will notice that the screen gives you 48 frequencies in 6 groups that hold 8 frequencies each. You will only use the first two places in the group for your frequencies. Remember you can only put a total of 12 high frequencies in per channel. There are 2000 programmable channels for your use. To start programming the software first choose the channel program number you are going to use. To do this click on the program arrow with your mouse. A window will open up so that you can move the bar up or down and choose the program number you want. If the number is high you can put the channel number in the window above the word jump, then click on jump and it will go to that channel for programming.



This is the multi-frequency screen.



Choose the program channel number.

Instructions continued on next page.

To program the program number you have chosen with frequencies all you have to do is click on the first frequency window with your mouse. The cursor will begin flashing on and off. Enter your first frequency and then using the "Tab" button on your computer keyboard, advance to the next frequency location and enter it in. Remember only 2 high frequencies per group and they should be put in the first 2 frequency windows in each group, as shown below. Remember that both frequencies in each group must be either above 1 million Hertz (1 MHz) or below 1 million Hertz down to 40,001 Hertz. Do not mix frequencies above 1 MHz with frequencies below 1 MHz. Continue entering 2 frequencies per group until you have entered in all of the desired frequencies.

Untitled.gb - GB4000

File Edit View Tools Help

Program Type

☐ Single Frequencies

☒ Frequency Groups

Program

3

<- >- Jump

Load Device

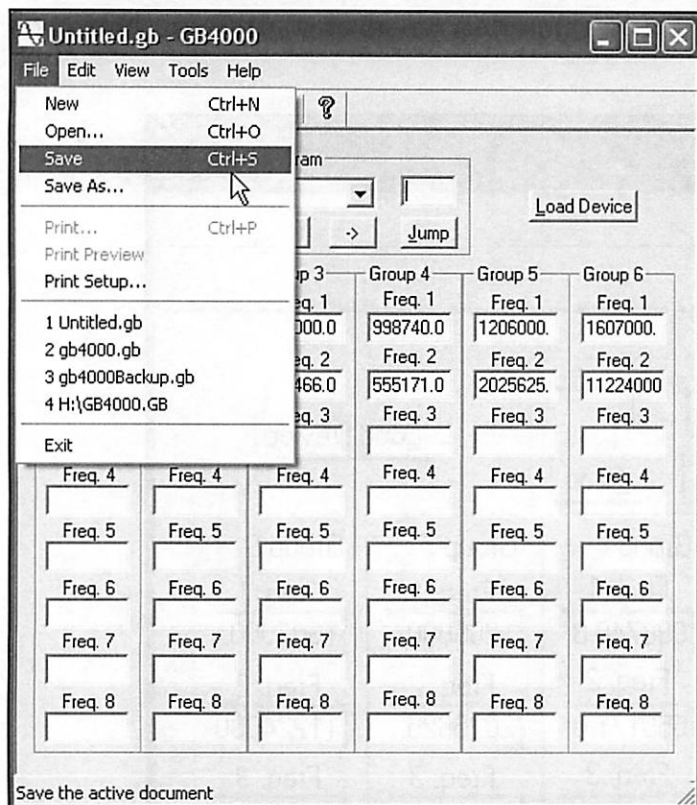
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Freq. 1	Freq. 1	Freq. 1	Freq. 1	Freq. 1	Freq. 1
678000.0	900000.0	160000.0	998740.0	1206000.	1607000.
Freq. 2	Freq. 2	Freq. 2	Freq. 2	Freq. 2	Freq. 2
185554.0	272539.0	512466.0	555171.0	2025625.	11224000
Freq. 3	Freq. 3	Freq. 3	Freq. 3	Freq. 3	Freq. 3
Freq. 4	Freq. 4	Freq. 4	Freq. 4	Freq. 4	Freq. 4
Freq. 5	Freq. 5	Freq. 5	Freq. 5	Freq. 5	Freq. 5
Freq. 6	Freq. 6	Freq. 6	Freq. 6	Freq. 6	Freq. 6
Freq. 7	Freq. 7	Freq. 7	Freq. 7	Freq. 7	Freq. 7
Freq. 8	Freq. 8	Freq. 8	Freq. 8	Freq. 8	Freq. 8

Ready

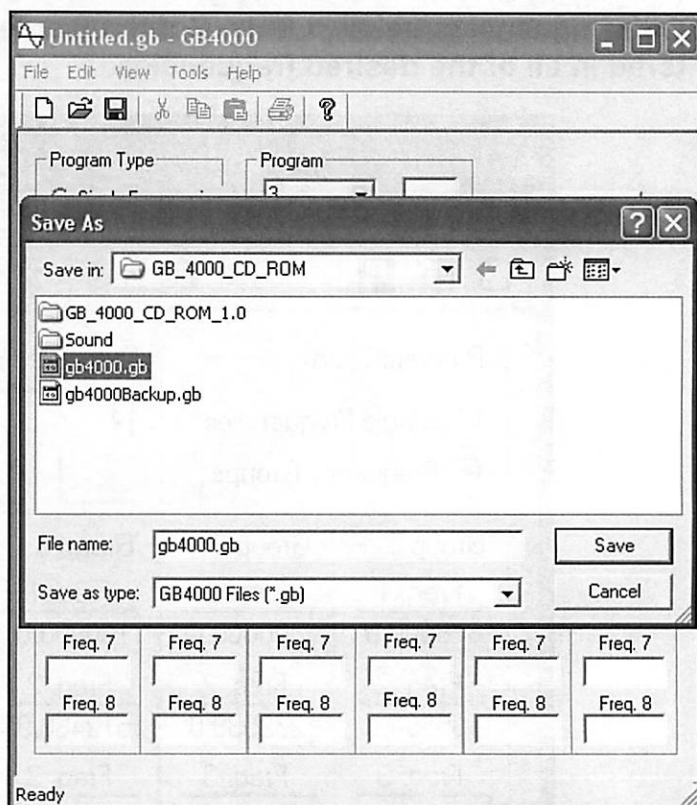
Enter the desired frequencies.

Instructions continued on next page.

Now that you have programmed your channel you need to save it. Click on "File" and choose "Save." The next screen will give you the choice of where to save the file. We suggest that you save it in the "GB4000 Program Software" file folder. You can save the file over the existing GB4000.gb file. This will make it so that all the existing programs and the new programs that you create will all be in the same file. To save it just click on the "GB4000.gb" file and then click on the "Save" button.



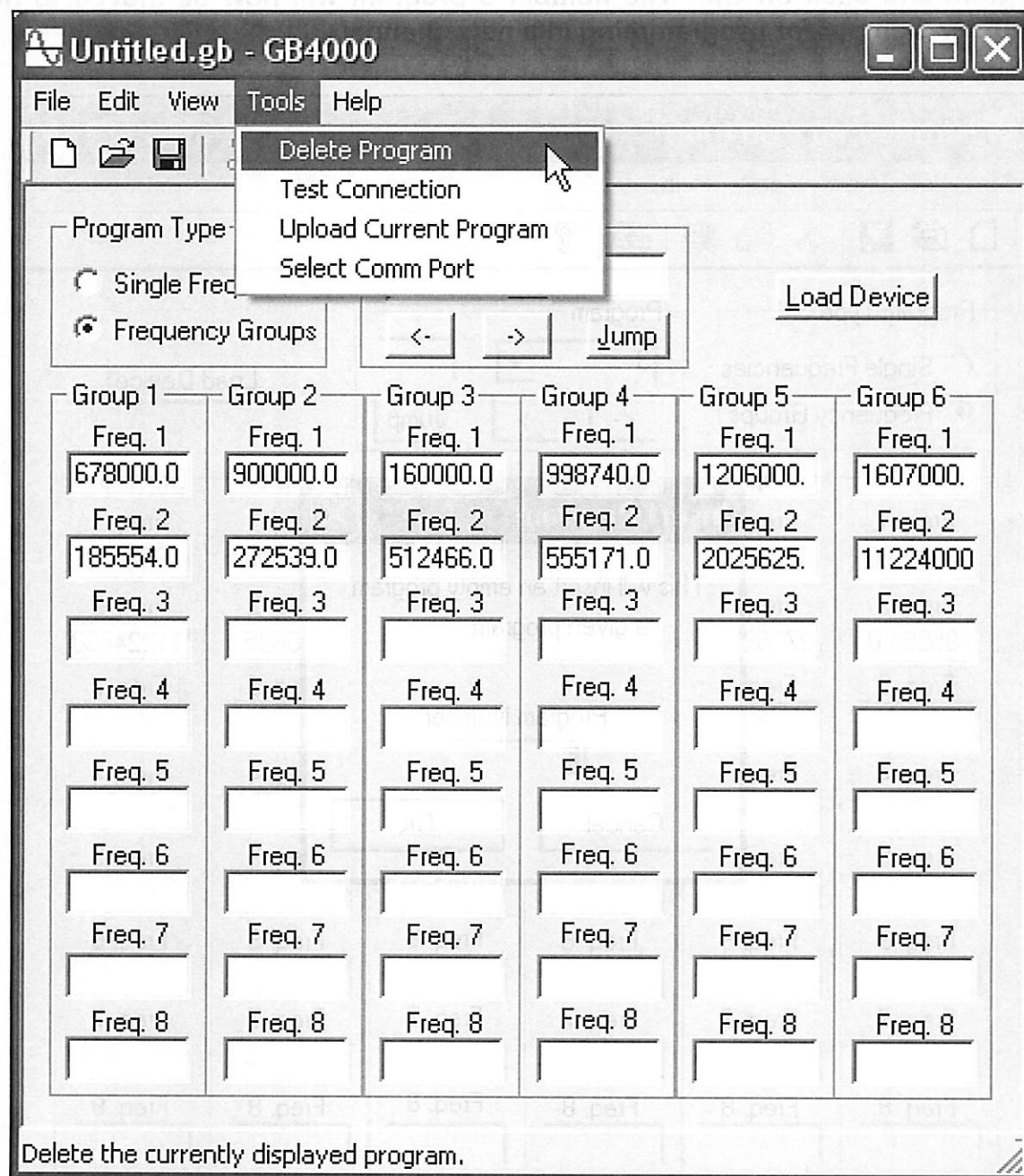
Click on "File" and then click on "Save."



Choose the "GB4000.gb" file and click "Save."

Deleting A Program With the Software

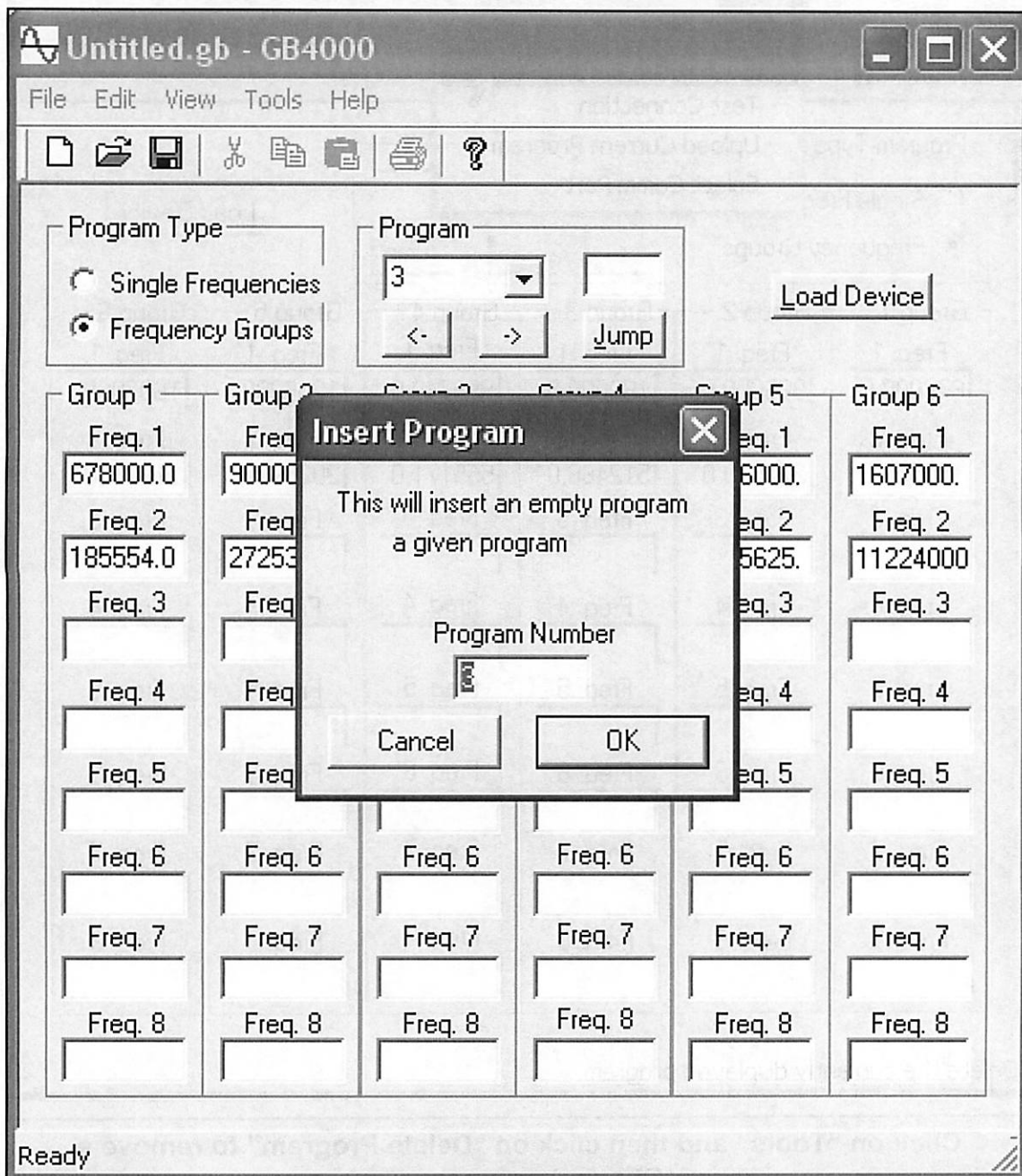
If you want to delete a program that you have entered in software, all you have to do is click on "Tools" with your mouse and then click on "Delete Program" and the program will then be deleted.



Click on "Tools" and then click on "Delete Program" to remove a Channel or program.

Inserting A Program In The Software

Many people want to keep their programs in alphabetical order. The insert program function makes it very easy to do this. If you want to put an empty program in where one exists all you have to do is click on "Edit" and then "Insert Program." Then for instance if you want to move the number 3 program to number 4 all you have to do is put number 3 into the insert program and click on Ok. The number 3 program will now be moved to number 4 leaving number 3 empty for programming in a new channel.



To insert a program just click on "Edit" and then click on "Insert Program."

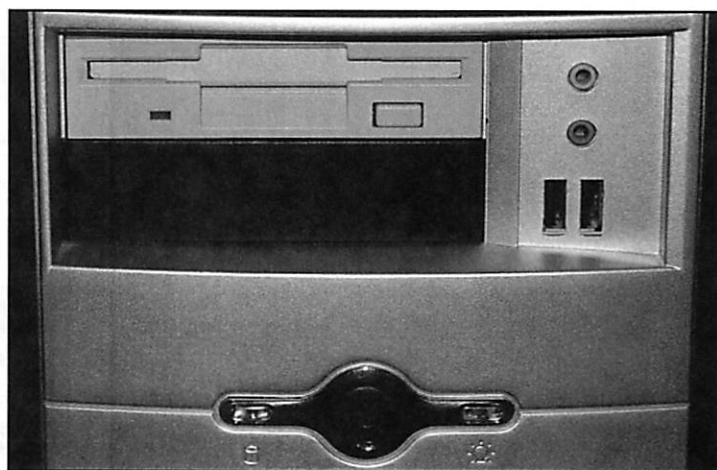
Loading Programs Into The GB-4000 With The Computer Software

To load the programmed channels into the instrument with the computer software you need to do the following steps.

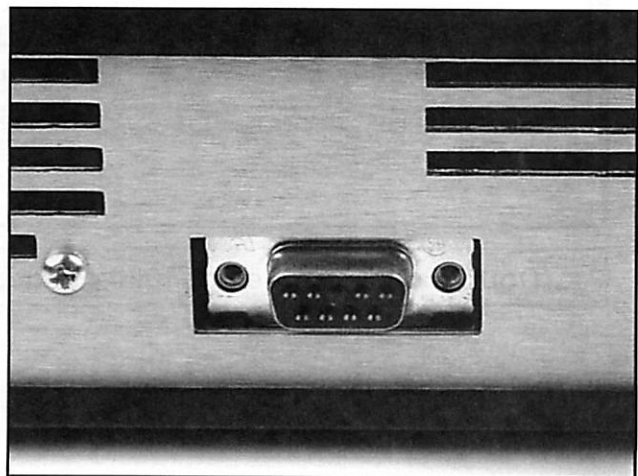
1. You will need the USB to Serial programming cable and its Driver CD.
2. Turn on your computer. After Windows loads put in the USB Driver CD.
3. Follow instructions to load the Drivers for the cable. If you are not familiar with computers you may have to take it to a computer store for help loading the Drivers.
4. Locate the USB port on your computer and plug in the USB to Serial cable after the Drivers have Loaded.



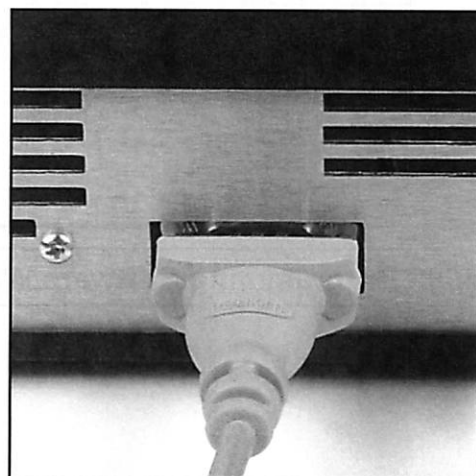
USB Cable.



Plug in Cable to USB port.



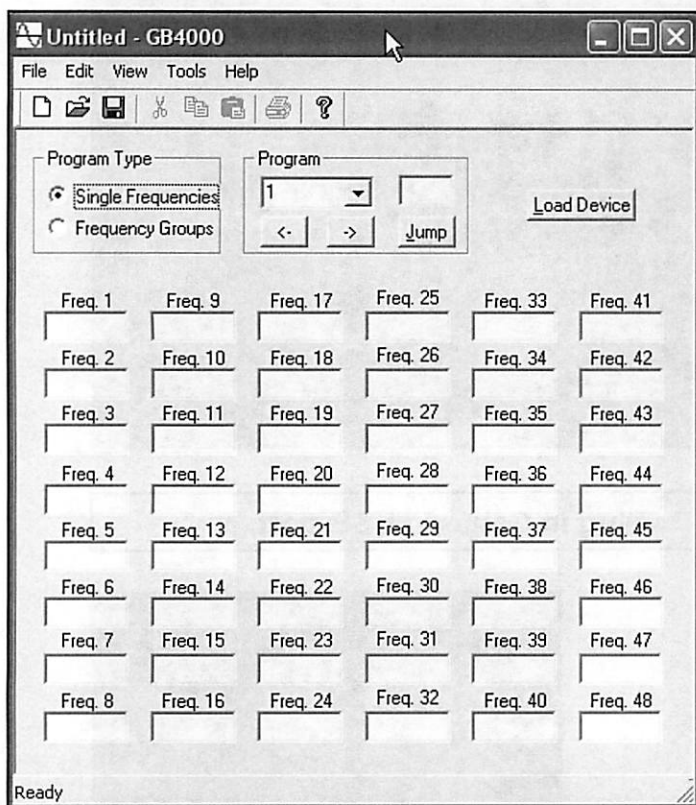
GB-4000 programming port.



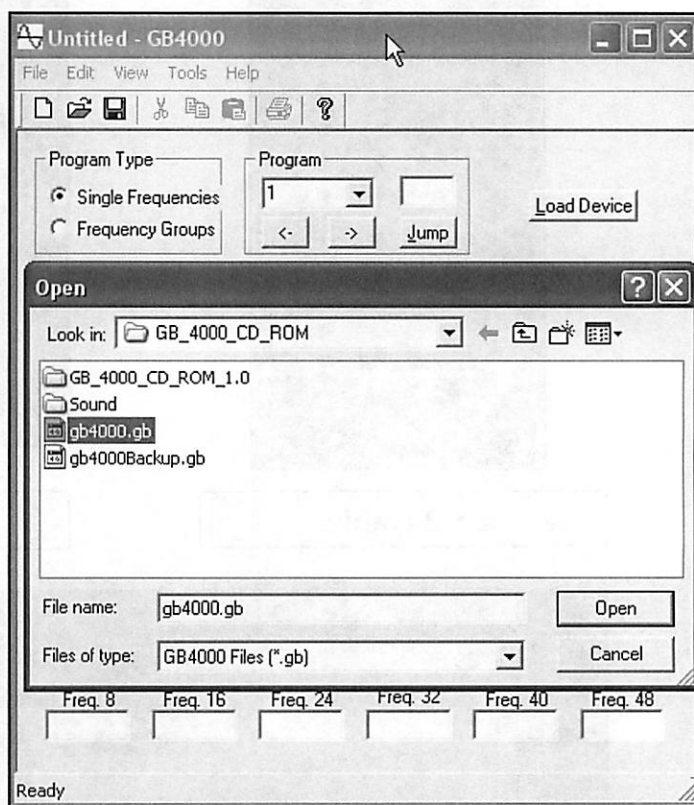
Plug in Cable and turned on.

Instructions continued on next page.

5. Now that the Windows Drivers are loaded you can connect the USB to Serial cable to the back of the GB-4000. Then turn on the GB-4000.
6. Put the GB-4000 Programming Software CD into your CD Drive. The Software should automatically open.
7. Click on "Start Programming Software". The frequency programming window will open. (shown below on the left).
8. Next click on the yellow folder in the upper left hand corner of the programming software window. It is right below "Edit".
9. A window will open (as shown below on the right) which will show you the files that are on the programming software CD.
10. Double click on the "gb4000.gb file." This will load all the frequencies in this file into the frequency windows in the programming software.



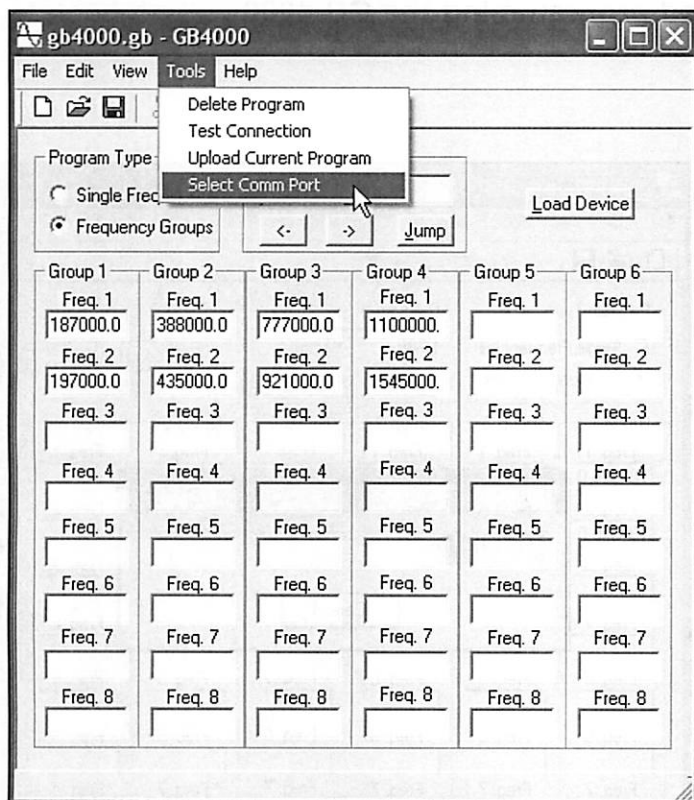
GB-4000 Programming Software Window.



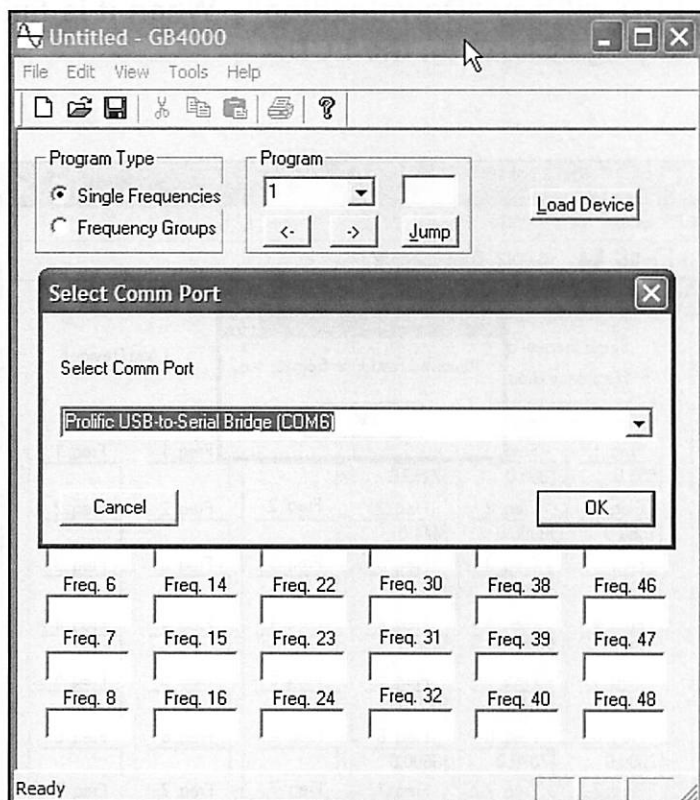
Double click on the "gb4000.gb file."

11. Next you need to select the proper “COMM Port” so that the computer can communicate with the GB-4000. Click on the “Tools” tab and choose “Select Comm Port” as shown below.

12. Next a window will open (as shown below) where you can select the proper Comm Port that has the “Prolific USB-to-Serial Bridge.” Once you have chosen the correct Comm Port the software will be able to communicate with the GB-4000.



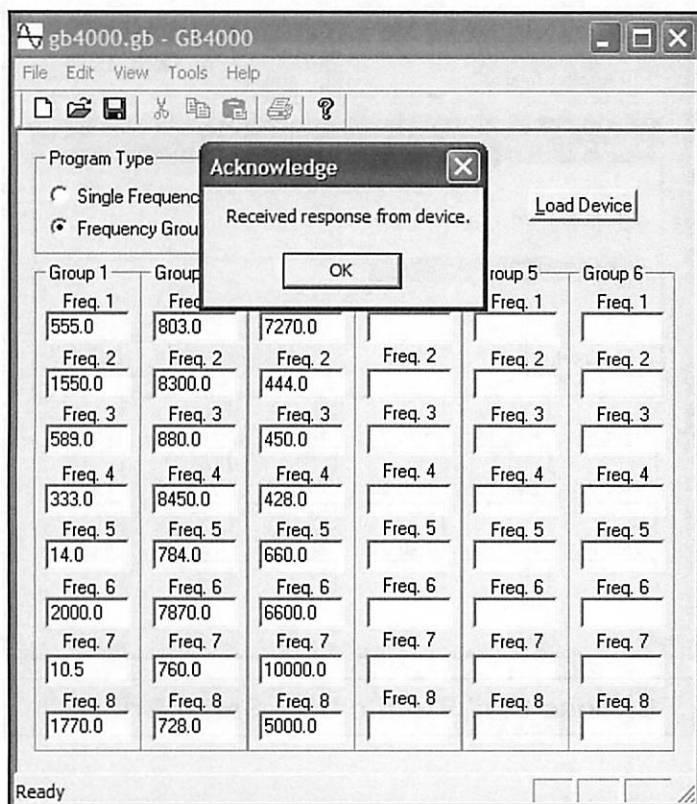
Click on “Select Comm Port.”



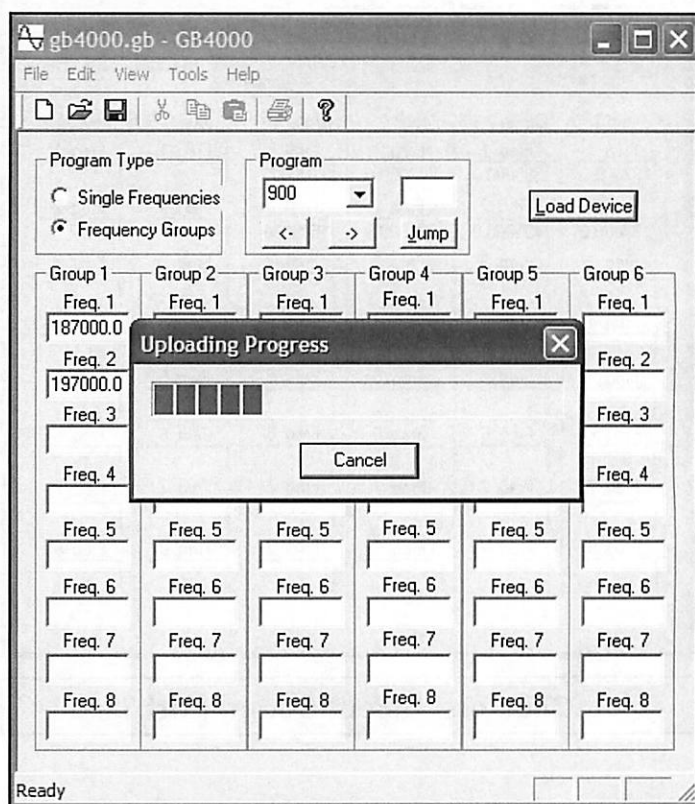
Choose the “Prolific USB Serial Bridge.”

13. Now you need to test the connection. Again click on "Tools" and then click on "Test Connection". It should say "Received response from device". If you did not get this message check your connections and make sure that you have correctly selected the proper "Comm Port".

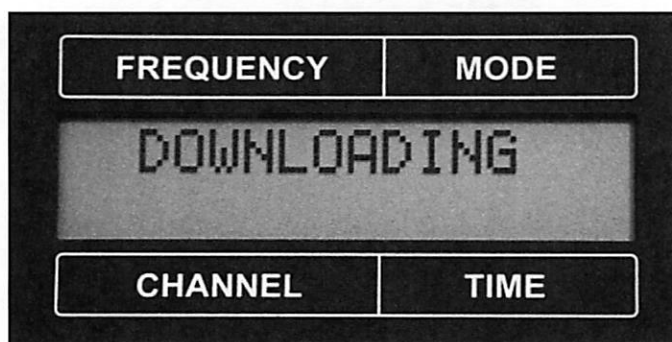
14. To program the GB-4000 click on "Load Device." button. Load Device will load all the programs that are in the software file. If you only want to load the program you are working on then see page 45. The computer screen will say "Uploading Progress" and the GB-4000 LCD will say "Downloading". When it is finished programming the GB-4000 will go back to saying "Start" on the LCD.



"Received response from device."



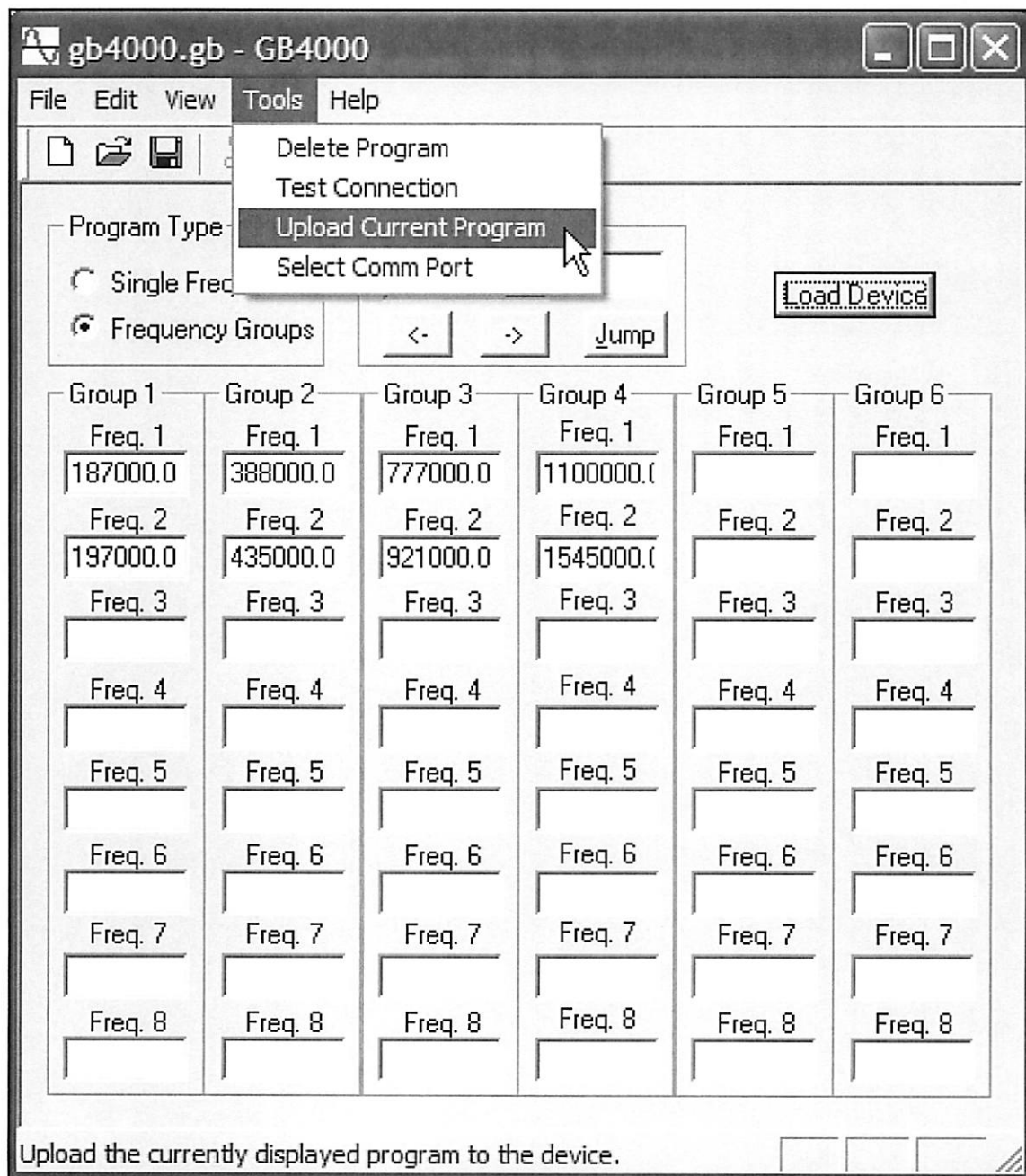
"Uploading Progress."



LCD will display "Downloading" during programming.

Loading a Single Program Into the GB-4000 With The Computer Software

If you have a programmed channel you want to load in the instrument without having to load all the channels, then all you have to do is click on "Tools" with your mouse and then click on "Upload Current Program." The current program that is on the software screen will then be loaded into the GB-4000.



To load a single program click on tools and then click on "Upload Current Program."