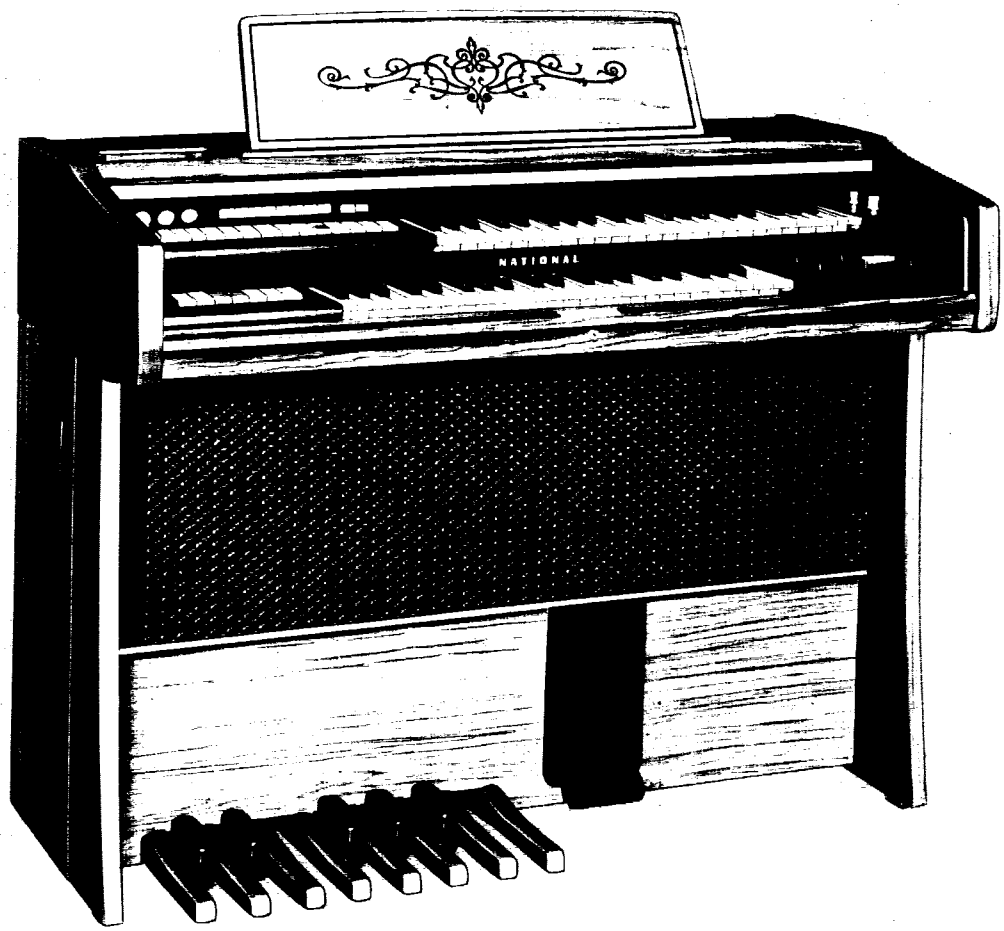
Operating Instructions

ELECTRONIC ORGAN



MODEL **SX-4000R**

Before operating this set, please read these instructions completely

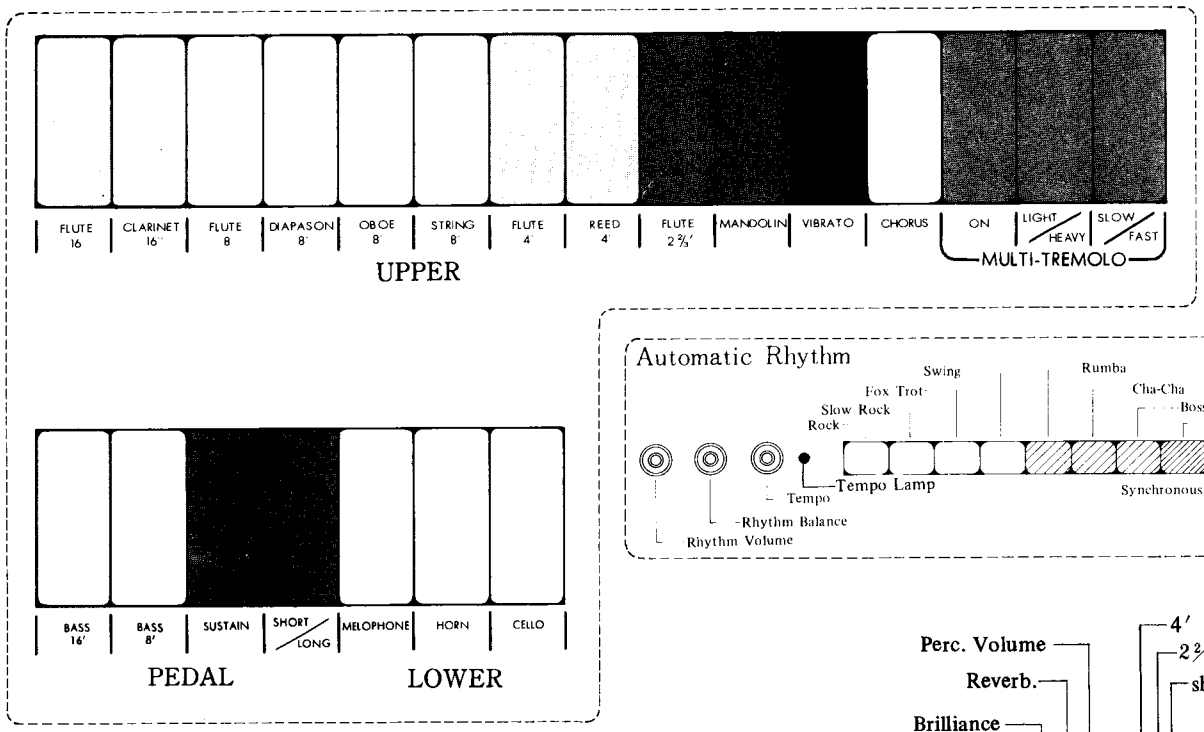
The National Electronic Organ
Operating Instructions

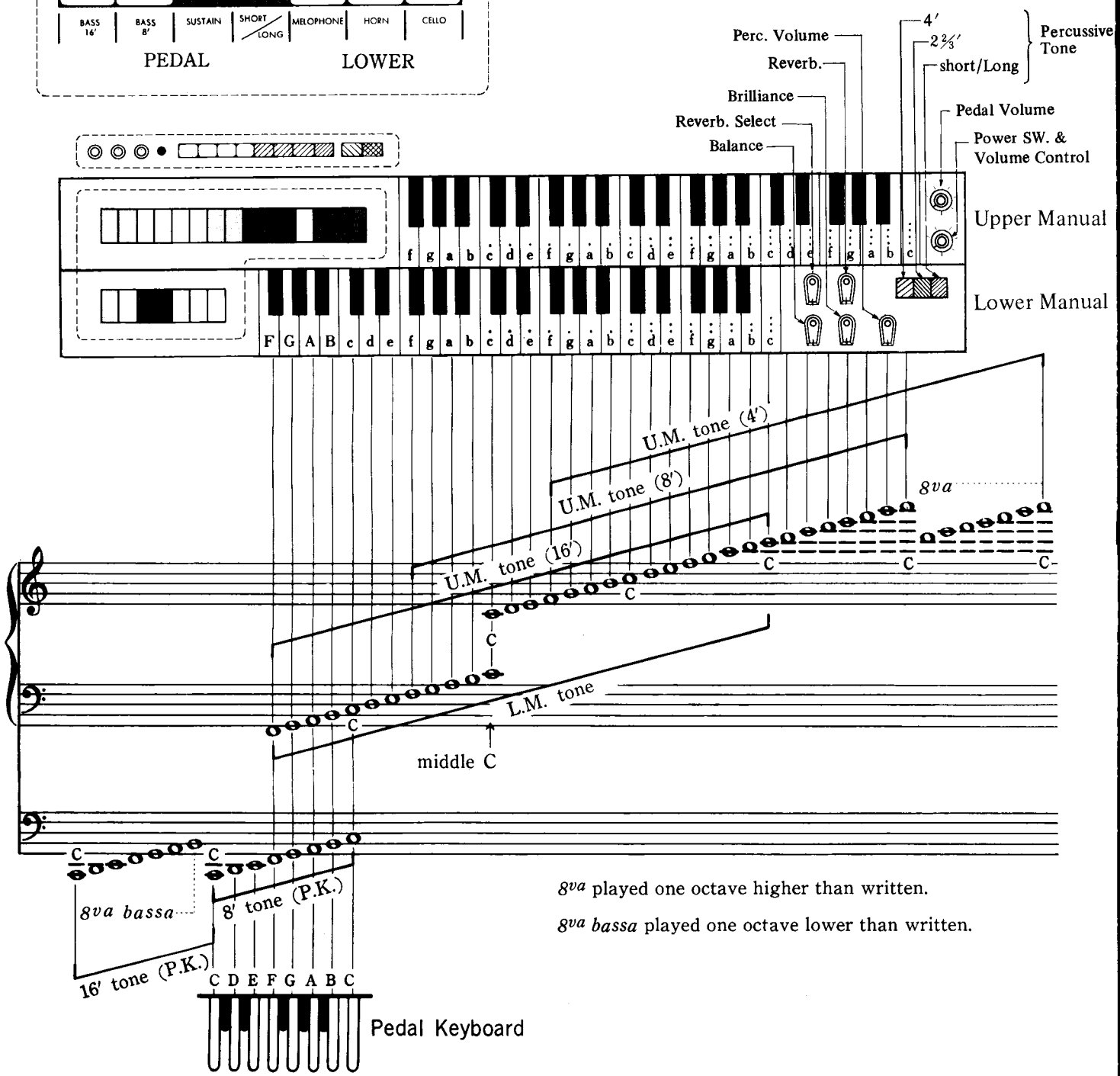
We are sure that you will get many years of pleasure from your new National Electronic Organ. This organ is a unique musical instrument designed for performance of the simplest and the most complicated music, and can be easily played by anyone, from the beginner to the most competent musician.

Read this booklet carefully for the proper use of your National Electronic Organ.

CONTENTS

NAMES OF CONTROLS & COMPASS CHART





8va played one octave higher than written.

8va bassa played one octave lower than written.

MAIN FEATURES

Multi-Tremolo Effect

Due to the "Multi-Tremolo" effect, sounds have a tremolo effect and are spread three-dimensionally, making the sounds very rich. Tremolo is ordinarily created by rotating a baffle before the speaker. "Multi-Tremolo" is, however, a new electronic method developed by National and has more clear and beautiful sounds than a conventional tremolo. Because a motor is not used, no noise is produced and the reliability is higher. This "Multi-Tremolo" can change the depth and speed of the sound with one touch. There is also an "Electronic Chorus" effect in addition to the "Multi-Tremolo" effect. This effect creates a rotational effect in slower sounds and is very useful for church music and special effects for light music.

Coupler Effect

The coupler effect is a sound effect of a keyboard type musical instrument which produces a combination of several tones sounding simultaneously when a single key is depressed. A mixture of these tones produces a very impressive sound.

The National Electronic Organ can produce the coupler sounds of 16′, 8′ 4′ and 2⅔′. 8′ tones have the same pitches as those of the notes written as the fundamental tones in a music score, 16′ tones are one octave lower than written, 4′ tones are one octave higher than written and 2⅔′ tone is higher by a twelfth than written. By pressing these tone tabs, you can mix the diverse pitches corresponding to 16′, 8′, 4′ and 2⅔′ tones to provide variety in tone color.

Automatic Rhythm

The Automatic Rhythm offers several types of rhythm, such as Rock and Bossa Nova with the sounds of many musical instruments, such as cymbals and maracas. Eight types of rhythm can be selected, and using two or more rhythm buttons or by using the rhythm balance lever, many different rhythms can be created. The operation is very easy because the rhythm is started by the Touch Start switch or by the Synchronous Start.

Glide Control Effect

With a switch inside the expression pedal, the tone of the keyboard glides down a half-tone. And when the switch is turned off, portamento is added and the sound is returned to normal. This effect produces an effect like a steel guitar and the portamento produces an effect like a trombone.

Percussive Tone

The percussive tones are particularly effective to obtain strikingly clear beginning sounds, or strong accents to the sounds. These are two percussive tones; 4′ and 2⅔′ tones. Of course, the strength and speed of diminishment can be varied.

KEYBOARDS

There are three keyboards – UPPER MANUAL, LOWER MANUAL and PEDAL KEYBOARD. The UPPER MANUAL keys are depressed (with the right fingers) mainly for melodies; the LOWER MANUAL keys (with the left fingers) mainly for accompaniment; and the PEDAL keys (with the toe of the left foot) mainly for bass.

Range

UPPER MANUAL	Extends from f to $\dot{c}$ 44 keys, 3½ octaves (medium to high-pitched tones)
LOWER MANUAL	Extends from F to $\dot{c}$ 44 keys, 3½ octaves (low to medium-pitched tones)
PEDAL KEYBOARD	Extends from C to c 13 keys, 1 octave (bass tones)

(See Compass Chart, page 4.)

Touch

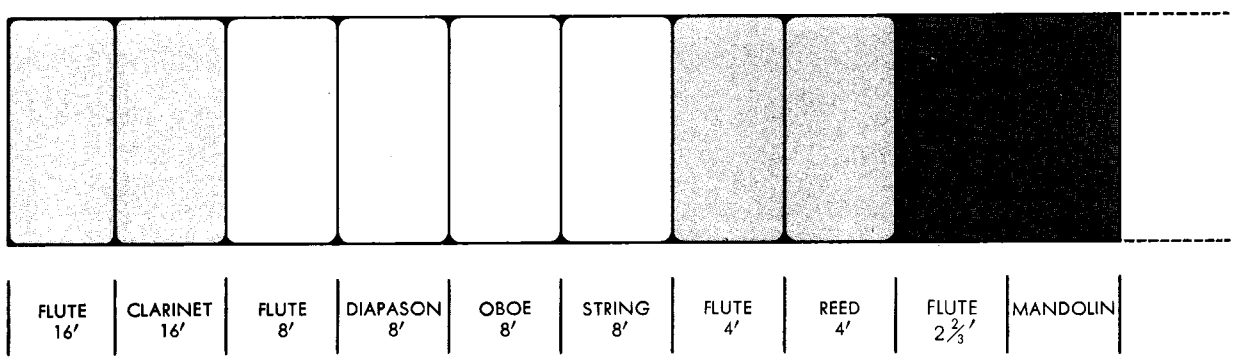
Unlike the piano, the touch on the Electronic Organ keys does not change the volume or quality of sounds produced. You do not need to change your touch nor to learn a difficult finger technique, you may play the keys with a minimum of pressure.

TONE TABS

The tone tabs produce individual sounds when depressed at the bottom, and stop the sounds when depressed at the top.

Upper Manual Tone Tabs

The Upper Manual provides two 16′ tones, four 8′ tones, two 4′ tones, one 2⅔′ tone and one special effect tone; FLUTE 16′, CLARINET 16′, FLUTE 8′, DIAPASON 8′, OBOE 8′, STRING 8′, FLUTE 4′, REED 4′, FLUTE 2⅔′ and MANDOLIN. Their combinations produce many other beautiful tone colors.



FLUTE 16′

The FLUTE 16′ tone has the simplest harmonics, and its tone quality is soft and mellow, like an orchestral flute, and is suitable for playing melodies. Its pitch is lower by one octave than written on a music score.

CLARINET 16′

The CLARINET 16′ tone has a smooth and hollow tone quality, like an orchestral clarinet, and is wspecially suitable for playing melodies. Its pitch is lower by one octave than written on a music score.

FLUTE 8′

The FLUTE 8′ tone is the same quality as that of the Flute 16′ tone, but its tone pitch is the same as written on a music score.

DIAPASON 8′

The DIAPASON 8′ tone has the foundation tone quality found in no other instrument than a pipe organ and has a special personality in tone color. It is slightly heavy and dull, rather than brilliant in tone quality, and is suitable for playing chords. It has the same pitch as written.

OBOE 8′

The OBOE 8′ tone has a strong personality, characterized by heavy upper harmonics, and its tone quality is rather reedy and more brilliant than any other tone. It has the same pitch as written.

STRING 8′

The STRING 8′ tone is a rather bright tone, like an orchestral violin, its tone quality is characterized by especially intense upper harmonics, and is suitable for playing melodies and chords. It has the same pitch as written.

FLUTE 4′

The FLUTE 4′ tone is the same quality as that of the Flute 16′ tone but its tone pitch is higher by one octave than written.

REED 4′

The REED 4′ tone is the same quality as that of the Oboe 8′ tone, but its tone pitch is higher by one octave than written.

FLUTE 2⅔′

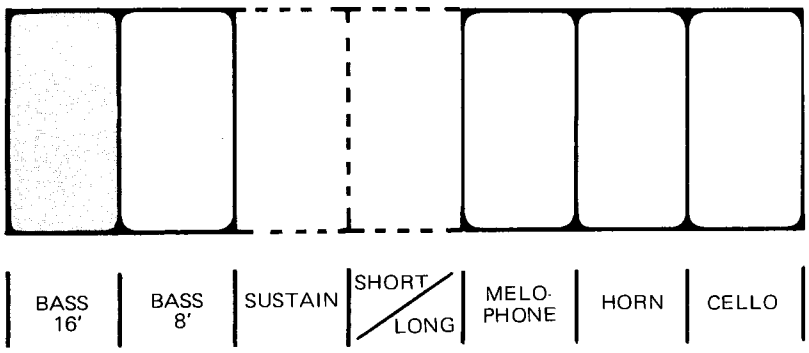
The FLUTE 2⅔′ tone is the same quality as that of the Flute 8′ tone, but its tone pitch is higher by a twelfth than written. This Flute 2⅔′ tone is used combined with the fundamental tone, sounding simultaneously when a single key is depressed.

MANDOLIN

The MANDOLIN tone is a repeated percussive tone, like a mandolin, and has a brighter tone quality. It is suitable for playing melodies, and it can be used as special effects in tone color.

Lower Manual Tone Tabs

The Lower Manual provides three tones; MELOPHONE, HORN and CELLO. Their combinations produce many other beautiful tones.



MELOPHONE

The MELOPHONE tone is round, soft and mellow and has a quality similar to that of the FLUTE 8′ tone of the upper manual. It is suitable for playing melodies.

HORN

The HORN tone is a solo tone having a particular personality of harmonics and is suitable for playing melodies. This tone can be compared to the OBOE 8′ tone of the upper manual.

CELLO

The CELLO tone is rather brighter than other tones of the lower manual, and has a full and rich tone which imparts strength to any combination of tone tabs. It is suitable for playing melodies and chords.

Pedal Keyboard Tone Tabs

The Pedal Keyboard provides one 16′ tone and one 8′ tone; BASS 16′ and BASS 8′. Their combination produces other rich tone for bass sounds.

BASS 16′

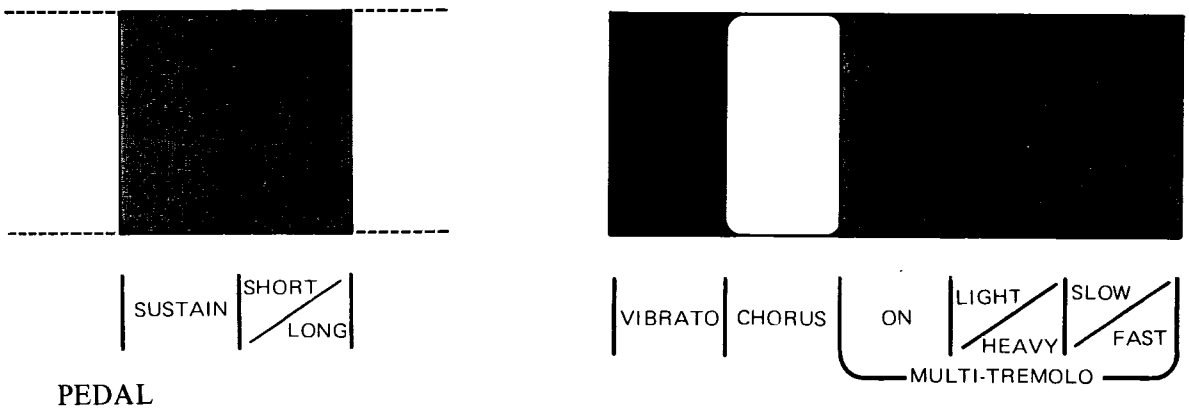
The BASS 16′ tone is the lowest pitch tone obtained by the organ, and produces a deep and rich bass tone. Its pitch is lower by one octave than written.

BASS 8′

The BASS 8′ tone has the foundation of characteristics of the flute tone and the richness of the string tone. It is a round, mellow and heavy tone which is suitable for playing bass solo or accompaniment. It has the same pitch as written.

These tone tabs of the upper manual, lower manual and pedal keyboard can be used either separately or in any combination. The sound comes more fully as you use more tone tabs
By combining the various tone tabs, you can obtain infinite variations of tones.

EFFECT TABS



PEDAL

Multi-Tremolo Tabs

The three Multi-Tremolo tabs give a new tremolo effect and change the depth and speed of tremolo.

The MULTI-TREMOLO ON-OFF tab gives tremolo to the music when depressed at the bottom, and eliminates it when depressed at the top. The other two tabs (Light-Heavy & Slow-Fast) can change the degree of tremolo. When you adjust the degree of tremolo to suit the tune to be played, you can produce or eliminate the tremolo effect instantly by operating the Multi-Tremolo On-Off tab even while playing.

The MULTI-TREMOLO LIGHT-HEAVY tab can change the depth of tremolo by making tremolo heavier (when depressed at the bottom) or lighter (when depressed at the top).

Note that Multi-Tremolo Light-Heavy & Slow-Fast tabs operate only when The MULTI-TREMOLO ON-OFF tab is in the On position.

The MULTI-TREMOLO SLOW-FAST tab can change the speed of tremolo by making tremolo faster (when depressed at the bottom) or slower (when depressed at the top.)

Electronic Chorus Tab

The Chorus tab provides a slower rotational effect for the music when depressed at the bottom. But if you use it together with the Multi-Tremolo tab, the chorus effect is eliminated automatically.

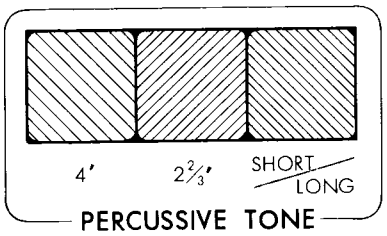
Vibrato Tab

The VIBRATO tab gives vibrato to the music when depressed at the bottom, and eliminates it when depressed at the top. When you want to change the degree of vibrato speed, use the Slow-Fast tab of the Multi-Tremolo.

EFFECT BUTTONS

Percussive Tone Tabs

The Percussive Tone is the effect, when the upper manual keys are pressed, the sounds gradually diminish. It is generally used with the fundamental tone tabs. It is particularly effective to obtain strikingly clear beginning sounds, or a performance which is very clear and crisp. The strength and speed of diminishment can be varied.



PERCUSSIVE TONE 4′

When this button is pressed to set it to the ON position (lower position), a percussive tone which is 4′ (one octave higher than the music score) is added to the upper manual. If this effect is not to be used, set to the OFF position by pressing it once again.

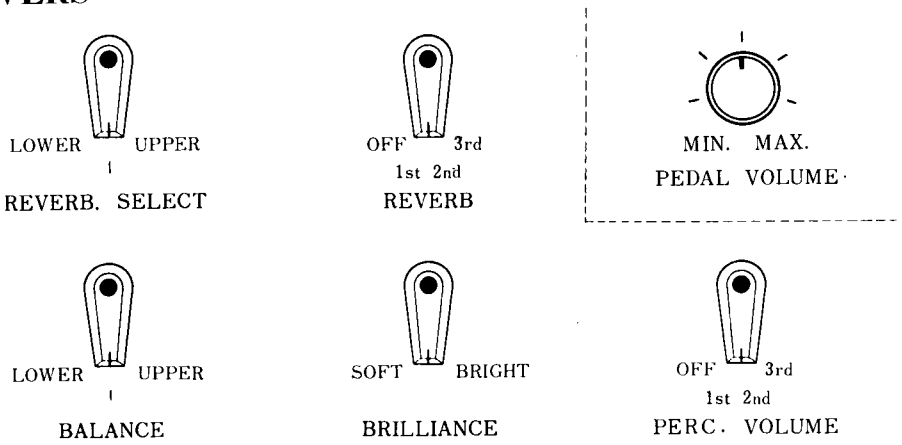
PERCUSSIVE TONE 2⅔′

When this button is pressed to set it to the ON position (lower position), a percussive tone which is 2⅔′ is added to the upper manual. This button can, of course, be used with the Percussive Tone 4′.

PERCUSSIVE TONE SHORT-LONG

This button is used to change the duration of the percussive tones. When set to the "LONG" position, by pressing it downward, a prolonged decreasing percussive tone is obtained, and when set to the "SHORT" position, by pressing it once again, a shorter decreasing percussive tone is obtained. Note that the percussive tone is obtained while the key is depressed, and disappears when released, even while decreasing . . . . . a feature very convenient when playing in legato because it is applied only to the beginning sound.

EFFECT LEVERS



Manual Balance Lever

The MANUAL BALANCE lever can control the volume balance between the Upper Manual and the Lower Manual at the discretion of the player. When this lever is set to the center point, the volume of both manuals becomes nearly equal. The lever set to the UPPER position causes the volume of the Upper Manual to exceed that of the Lower Manual, and vice versa with the lever set to the LOWER position.

Reverberation Lever

The REVERBERATION lever can change the length of the reverberation effect, giving a spaciousness and warmth to the music from OFF to 3rd degree. By changing the degree of the reverberation effect, you can bring various special effects to the music.

Reverberation Select Lever

The REVERBERATION SELECT lever can select the reverberation ratio of the Upper Manual tones and the Lower Manual tones. When you set this lever to the center point, the reverberation length of both manuals becomes equal. When this lever is turned to the Upper position, the reverberation of the Upper Manual tones exceeds that of the Lower Manual tones, and vice versa.

Brilliance Lever

The BRILLIANCE lever is similar to the brilliance knob or the tone control knob on a good high fidelity amplifier system. It can control the upper harmonics of tones from SOFT to BRIGHT and its normal position is the center point. When turned ot the BRIGHT position, the brilliance of the tones of the manual keyboards is emphasized, and when turned to the SOFT position, the brilliance is reduced completely. This lever is particularly effective in making the String tone, the Oboe tone, the 4′ tones and the 2⅔′ tone more brilliant.

Percussive Volume Lever

The PERCUSSIVE VOLUME lever is for the strength of the percussive tone. It can change the volume of the percussive tone from OFF to the 3 rd position. Set this lever to the proper position at your discretion. This Percussive Volume lever will not operate unless either the Percussive Tone 4′ or Percussive Tone 2⅔′ buttons are pressed.

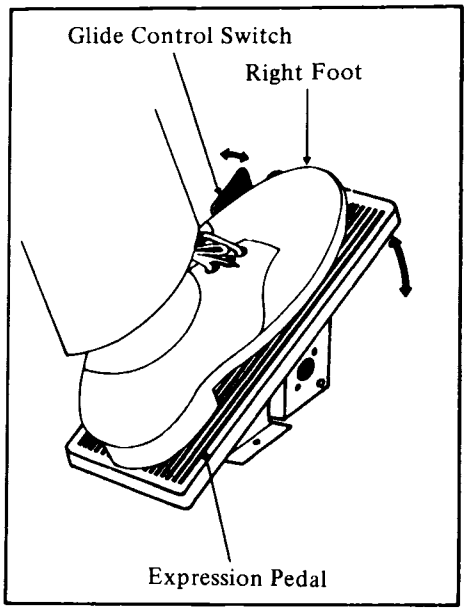
Pedal Volume Knob

The PEDAL VOLUME knob can control the volume of the sounds of the Pedal Keyboard from min. to Max. Set the Pedal Volume knob to its proper position to balance the sound volume of the Pedal K -eyboard with that of the Upper and Lower Manuals.

OTHER CONTROLS

Glide Control Switch

The GLIDE CONTROL SWITCH is on the left of the expression pedal. (Refer to the figure at the right.) This switch is operated by the toe of the right foot. If this switch is pushed to the left, the sound glides down approximately one-half of a tone. When the switch is no longer operated, the sound will return to the original tone by portamento.

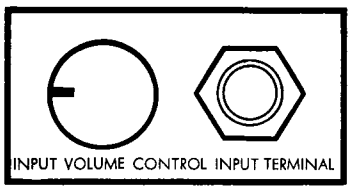


Expression Pedal

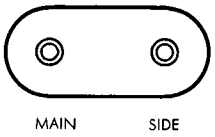
The EXPRESSION PEDAL is operated with the right foot. It changes the volume of the electronic organ to create musical expression. Pressing forward with your toe increases the volume, pressing backward with your heel decreases it.

Power Switch & Volume Control

The POWER SWITCH & VOLUME CONTROL is set to the maximum level of the organ when the Expression Pedal is used. If the Expression Pedal is not used, the Volume Control should be adjusted to the desired level. After playing the organ, the Volume Control is turned counterclockwise to a position at which the power will be switched off.



(Under the Left Side of the Keyboard)



(Under the Right Side of the Keyboard)

Headphone Jack

The HEADPHONE JACK is under the right side of the keyboard. Headphones (optional) are plugged into the Headphone Jack, and the amplifier is automatically switched off. Thus you may practice in a room where people are talking without disturbing others. Use stereo headphones, not monaural headphones.

Output Terminals (MAIN, SIDE)

The OUTPUT TERMINALS are under the right side of the keyboard. These can be connected with an external stereo amplifier or stereo tape recorder when you use this Electronic Organ in a large hall or to record the music of this organ without outside noises.

Connect the MAIN and SIDE output terminals of the organ to the RIGHT and LEFT input terminals of the external stereo amplifier or stereo tape recorder. Because the "Multi-Tremolo" effect is produced electronically by a 2-channel stereo system, beautiful "Multi-Tremolo" effects can be produced for performance in a large hall by using only andexternal stereo amplifier (output level 360mV. 600Ω)

Input Terminal

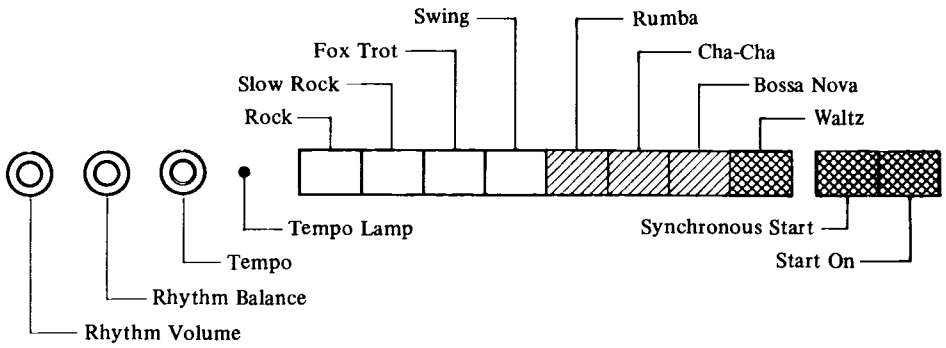
The INPUT TERMINAL can be connected with a tape recorder or a rhythm box, etc., for the purpose of reproducing their sounds. It is located under the left side of the Keyboard (input level 25mV. 15KΩ).

Input Volume Control

The INPUT VOLUME CONTROL sets the level of the input signal. Note that this volume control can not change the volume of the Electronic Organ.

AUTOMATIC RHYTHM SECTION

The automatic rhythm section has three rhythm control knobs, eight rhythm selector buttons, two rhythm start switches and one tempo lamp. These rhythm controls are located on the front of the tablet switches for the upper manual keyboard.



Rhythm Selection Buttons

This rhythm section has eight rhythm selectors. They are Rock, Slow Rock, Fox Trot, Swing, Rumba, Cha-Cha, Bossa Nova and Waltz. Select your favorite and push the corresponding button.

This button switch turns on the rhythm when you push it. These are interlocking switches, so that when you push a rhythm selection, the previous rhythm turns off automatically.

If you push two or more rhythm selection buttons at the same time, a complex and interesting rhythm can be created.

Rhythm Control Knob

RHYTHM VOLUME CONTROL

When the Rhythm Volume Knob is turned to the right (clockwise), the volume of the rhythm increases gradually. Adjust the volume of the rhythm according to the volume of the keyboard sounds.

It should be noted with caution that the main volume and expression pedal of the organ have some influence on the volume of the rhythm.

RHYTHM BALANCE CONTROL

If the knob is turned clockwise, the percussion instrument sound of the cymbals and the maracas becomes gradually louder, while the sound of the other percussion instruments becomes lower. If the knob is turned counterclockwise, the sound of the claves, the cowbell and the snare drum becomes louder and the sound of the cymbals and the maracas becomes lower. Thus, set it to the desired position. Also, if this knob is turned clockwise or counterclockwise until it stops, it can be used as a cancel effect, and in this way various rhythms can be created.

Tempo Control

If you turn the Tempo Control Knob clockwise, the tempo of the rhythm increases. The tempo of the rhythm should be adjusted according to the music you play.

The Tempo Lamp near the tempo control knob is designed to illuminate brightly on the first beat Therefore, you can easily adjust the tempo by watching the tempo lamp. If the synchronous start switch is turned to the on position, the tempo lamp indicates a beat interval even though the rhythm has not yet started. It is, therefore, possible to adjust the beat without emitting the percussion inst rument sounds.

Rhythm Start Switches

There are three starting methods for rhythm as shown below. In all cases, the rhythm begins with the first beat.

START SWITCH BUTTON [ON]

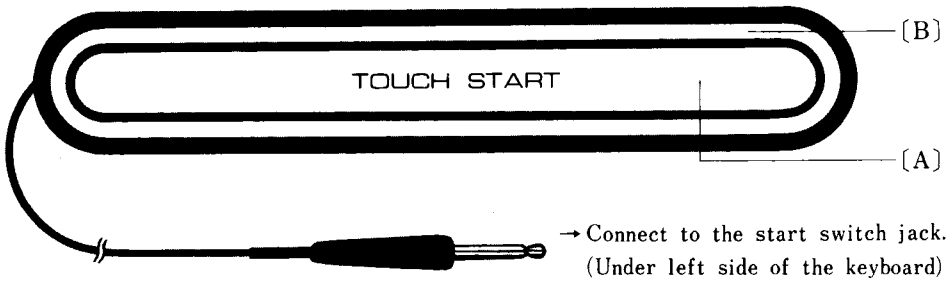
If the START SWITCH BUTTON is pushed while the rhythm is operating, the rhythm will stop. On the other hand, if it is pushed when the rhythm isn't operating, the rhythm will begin. Even if the remote touch start switch, which is included, is connected, the same start/stop operation can be expected.

SYNCHRONOUS START SWITCH BUTTON [SYNCHRO]

If the SYNCHRONOUS START SWITCH BUTTON is pushed beforehand (in the condition where the button is depressed), the rhythm will start when either the lower manual keyboard or the pedal keyboard is played. In this manner, it is very convenient. If the remote touch start switch, which is included, is connected, the same operation can be expected. Therefore, it becomes very easy to play using these as a combination.

If the performance is conducted without using the synchronous start switch button, this button should be pressed again to set it to the "OFF" position (in the condition where the button is not depressed). The rhythm will be turned off by pushing this button during performance.

REMOTE TOUCH START SWITCH [TOUCH START]



If the plug of the REMOTE TOUCH START SWITCH, which is included, is connected to the start switch jack which is located on the under left side of the keyboard, the on/off operation of the rhythm can be easily accomplished by touching softly. Because the rhythm starts by touching lightly with the fingers and it will stop when touched again, quick operation is possible by placing near the keyboard during performance making it very convenient.

* When using the touch start switch, be sure to touch the inside of the switch, part [A] and the outside, part [B], at the same time. Part [A] and [B] are designed to be touched simultaneously and, if only one part is touched, the start switch will not operate. Therefore, care should be exercised.
* Avoid using near fluorescent lamps, neon lamps, transformers or motors. If jused in these areas, unwanted noise may occur and the touch start may fail to operate normally.

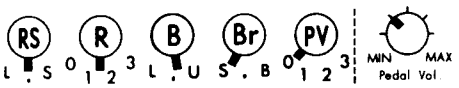
SOME TYPICAL REGISTRATIONS

Here are some examples of registrations which will help you find out effective tones of your performance. These registrations are only typical ones. You will be able to find many variations referring these examples.

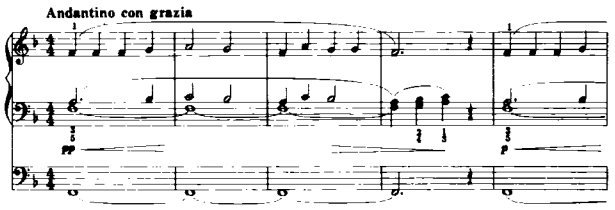
Flute フルート

Upper : FLUTE 8'
Lower : MELOPHONE
Pedal : BASS 8'

Vibrato On
Multi-Tremolo On-Light-Slow



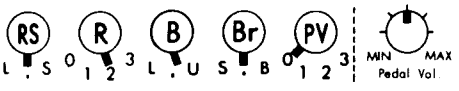
AU CLAIR DE LUNE
月の光に



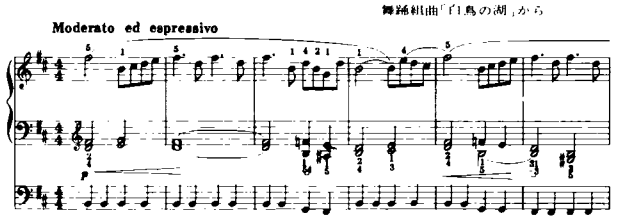
Oboe オーボー

Upper : OBOE 8'
Lower : HORN
Pedal : BASS 16', BASS 8'

Pedal Sustain On-Short
Vibrato On
Multi-Tremolo On-Light-Slow



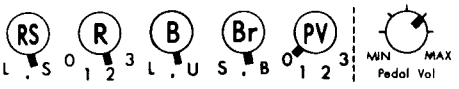
SCENE
(The Swan Lake, ballet suite)
情景
舞踊組曲「白鳥の湖」から



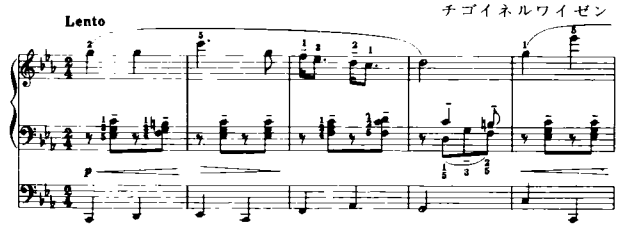
Violin バイオリン

Upper : STRING 8'
Lower : MELOPHONE, HORN
Pedal : BASS 8'

Vibrato On
Multi-Tremolo On-Light-Fast



ZIGEUNERWEISEN
チゴイネルワイゼン

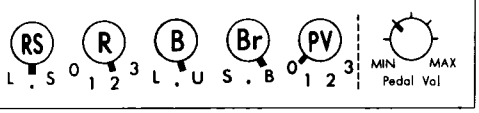


Mandolin マンドリン

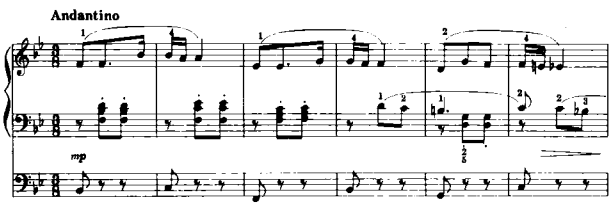
Upper : MANDOLIN
Pedal Sustain On-Long
Chorus On

Lower : MELOPHONE

Pedal : BASS 16', BASS 8'



SANTA LUCIA
サンタルチア

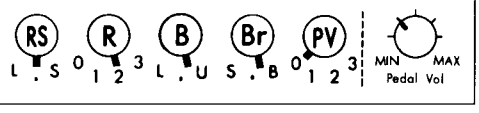


English Horn イングリッシュホルン

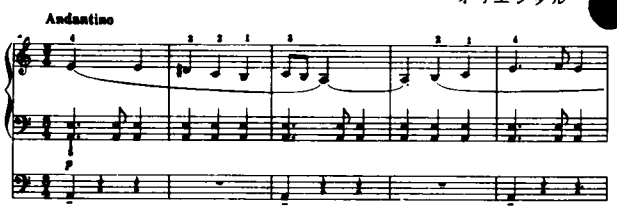
Upper : DIAPASON 8', OBOE 8'
Vibrato On
Chorus On

Lower : MELOPHONE, HORN

Pedal : BASS 16', BASS 8'



THE ORIENTAL
オリエンタル

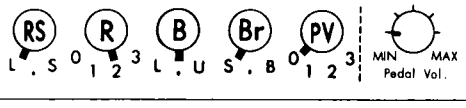


French Horn ホルン

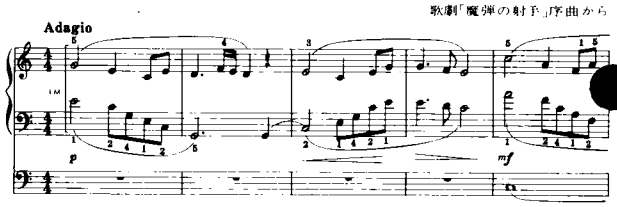
Upper :
Chorus On

Lower : HORN

Pedal : BASS 8'



DER FREISCHÜTZ
秋の夜半
歌劇「魔弾の射手」序曲から

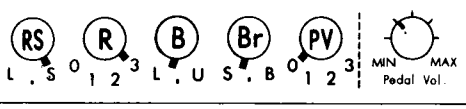


Cello チェロ

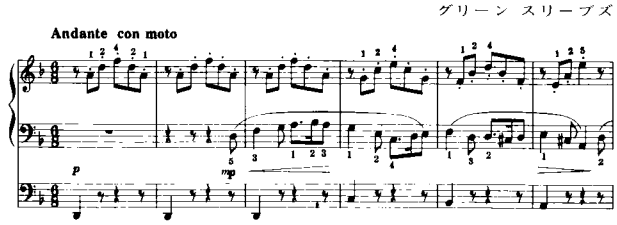
Upper : FLUTE 8'
Pedal Sustain On-Long
Multi-Tremolo On-Heavy-Slow

Lower : CELLO

Pedal : BASS 16', BASS 8'



GREEN SLEEVES
グリーン スリーブズ

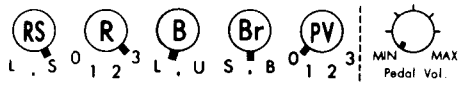


Sleigh Bells 鈴

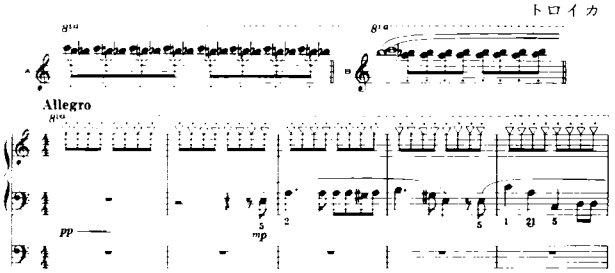
Upper : DIAPASON 8', OBOE 8' Vibrato On
Multi-Tremolo On-Heavy-Slow

Lower : HORN, CELLO

Pedal :



TROIKA
トロイカ

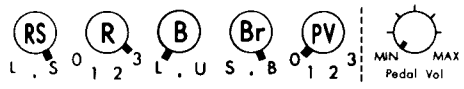


Chimes チャイム

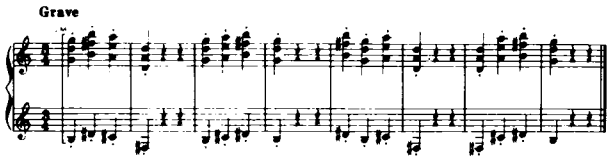
Upper : FLUTE 4' Chorus On

Lower :

Pedal :



THE CHIMES OF WESTMINSTER
ウェストミンスターの鐘

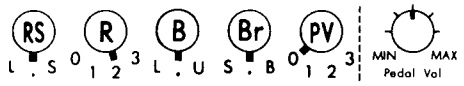


Organ Tone パイプオルガン

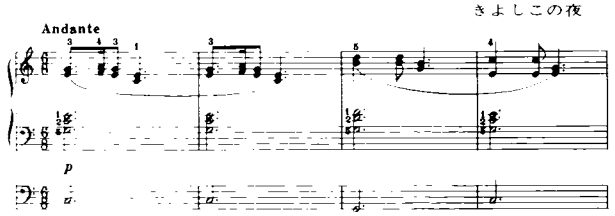
Upper : FLUTE 16', DIAPASON 8' Chorus On
FLUTE 4', REED 4'

Lower : MELOPHONE, HORN

Pedal : BASS 16', BASS 8'



SILENT NIGHT
きよしこの夜

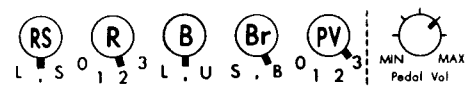


Light Music Tone
ポピュラー ミュージック トーン

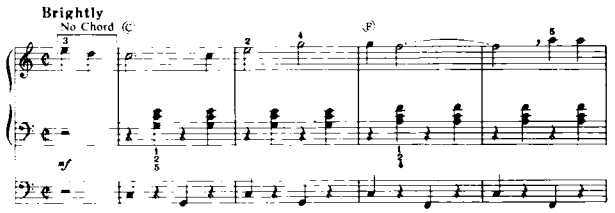
Upper : FLUTE 16' Pedal Sustain On-Short
Chorus On
percussive Tone $2\frac{2}{3}$' On

Lower : MELOPHONE, HORN

Pedal : BASS 16', BASS 8'



WHEN THE SAINTS GO MARCHING IN
聖者が町にやってくる

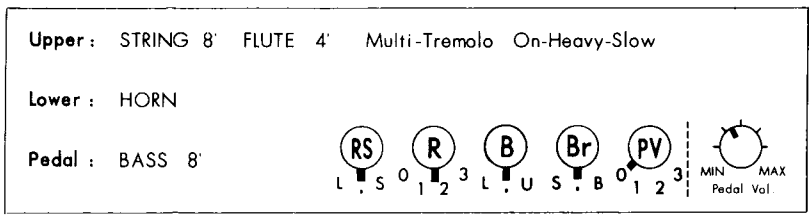


EXERCISES

Exercise 1

Let's begin with an easy melody of common time in C major. Before playing, adjust the controls according to the following illustration. Now play the upper staff of the score with the right hand on the Upper Manual, the middle staff with the left hand on the Lower Manual and the lower staff with the left foot on the Pedal Keyboard. You may count out loud to make sure your timing is accurate.

LIGHTLY ROW



Spanish Melody

Moderato

mf

mp

mf

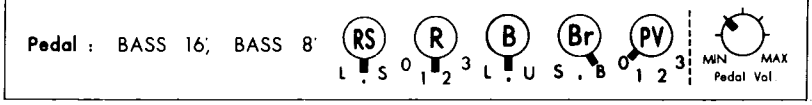
EXERCISES

Exercise 2

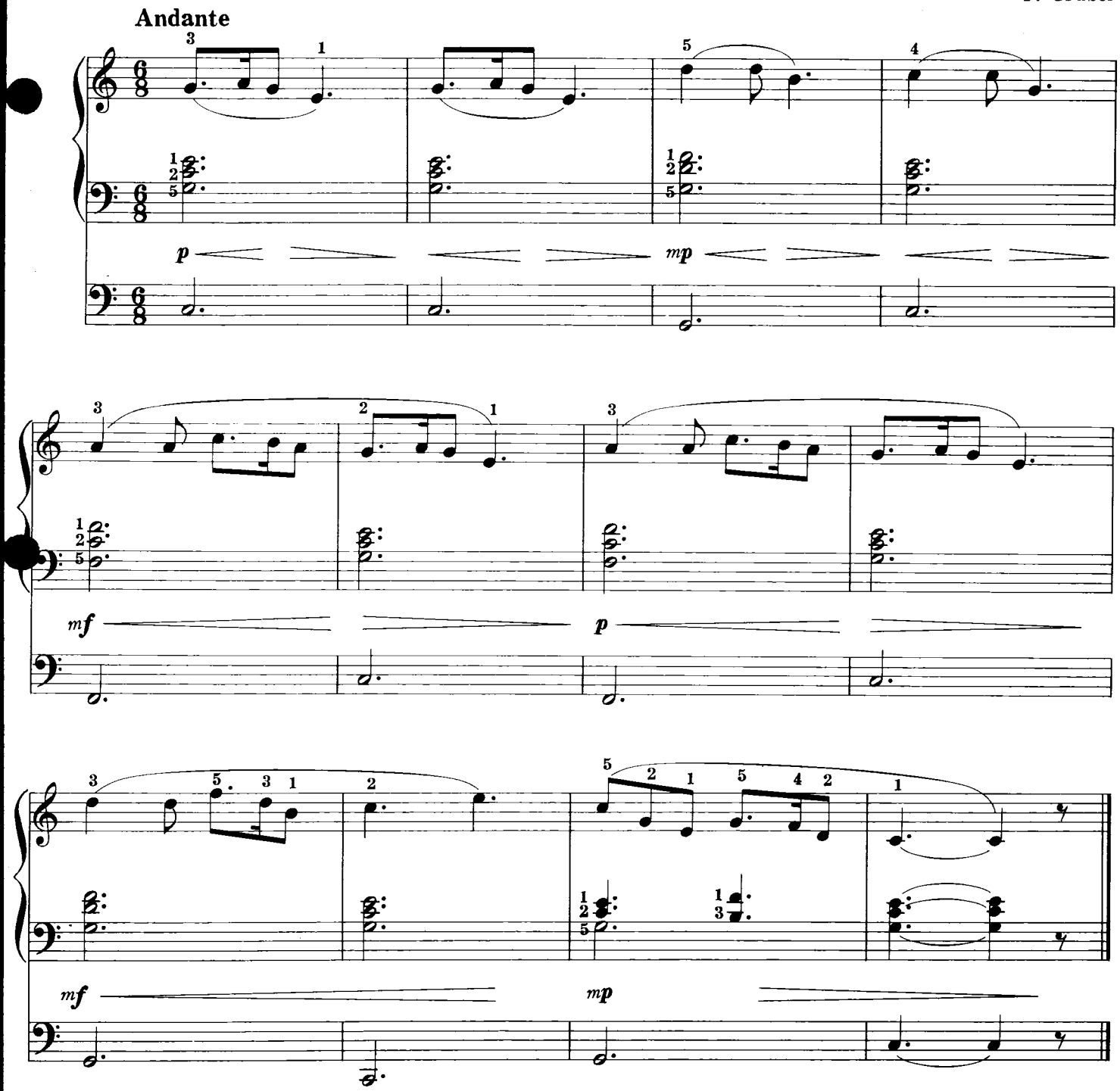
This is a well-known hymn. Practice to achieve a beautiful flow of the melody, moving the Expression Pedal slowly and smoothly according to the dynamic markings and signs designated in the score.

SILENT NIGHT

Upper : FLUTE 16' FLUTE 8' Chorus On
DIAPASON 8' STRING 8' FLUTE 4'
Lower : MELOPHONE, HORN
Pedal : BASS 16', BASS 8'



F. Gruber



MAINTENANCE SPECIFICATIONS

Maintenance

*Be sure to turn the switch off after playing.
*Because the keys are plastic, do not use thinner, benzine or other petro-chemicals, but polish them with a dry, soft cloth.
*Never attempt to touch the inner parts of the unit. For service or repairs, contact the store where purchased. When replacing a fuse, be sure it is the correct rating.
*The National Electronic Organ creates sounds with IC's and transistors, so tuning is entirely unnecessary.

Specifications

Key boards:	Upper Manual	44 keys	(F2-C6)
	Lower Manual	44 keys	(F1-C5)
	Pedal	13 keys	(C1-C2)
Tones:	Upper Manual Flute 16′, Clarinet 16′, Flute 8′, Diapason 8′, Oboe 8′, String 8′, Flute 4′, Reed 4′, Flute 2⅔′, Mandolin Lower Manual Melophone, Horn, Cello Pedal Bass 16′, Bass 8′		
Effects:	Multi-Tremolo . . . . . On-Off, Light-Heavy, Slow-Fast Electronic Chorus, Vibrato Pedal Sustain . . . . . On-Off, Short-Long Reverberation, Reverberation Select, Brilliance Percussive Tone . . . . . 4′, 2⅔′, Short-Long, Volume Glide Control, Manual Balance, Pedal Volume		
Automatic Rhythm:	Rhythm Selectors Rock, Slow Rock, Fox Trot, Swing, Rumba, Cha-Cha, Bossa Nova, Waltz Rhythm Volume, Rhythm Balance, Tempo Control, Tempo Lamp Start On/Off, Synchronous Start, Remote Touch Start Switch		
Others:	On/Off Power Switch & Volume Control Headphone Jack, Output Terminals (Main, Side) (360mV, 600Ω) Input Terminal (25mV, 15kΩ) Input Volume, Expression Pedal, Pilot Lamp Sliding Manual Cover, Lock		
Output:	45W (Peak Power)		
Speakers:	30cm (12″) x 1, 20cm (8″) x 1, 8cm (3″) x 1		
IC's:	56		
Transistors:	229		
Diodes:	201		
Power Requirement:	70W, AC 100/120/220/240V, 50-60Hz		
Cabinet:	Simulated Walnut		
Dimensions:	115cm (45.2″) [W] x 93cm (36.5″) [H] x 57cm (22.2″) [D]		
Net Weight:	75kg (165 lbs.)		

Specifications subject to change without notice

MATSUSHITA ELECTRIC
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