

RODGERS

SUGGESTED VOICING PROCEDURE

YORK 650

KENT 705

GLASGOW 740

EXETER 770

ASILOMAR 780

TUNING PROCEDURE

INTRODUCTION

There are two major steps in setting up an organ: tuning and voicing. Tuning refers to the process of setting the oscillators to play the correct notes or frequencies. Voicing involves setting the individual stops or voices so they are properly balanced for correct tonal quality.

Each new Rodgers organ is tuned and voiced first at the factory, again at the dealer's showroom, and finally at the installation site. When the organ is installed at a new location, the voicing should be checked since physical size and characteristics of the acoustical environment will affect the performance of the organ.

It is much easier to voice an organ when it is correctly tuned. Taking the time to tune the electronics before you voice will save much time and frustration later.

OSCILLATOR NUMBERING SYSTEM

For easy identification of the notes, keys and oscillators of all Rodgers organs are numbered such that the lowest 8' pitch (C) is note #1, (C#) is note #2, etc. The 16' Octave is identified by notes 01-012. The 32' Octave would be 001-0012. To find the note number and oscillator for any stop on any key, refer to the keying chart. Also, guide numbers have been stamped on the racks which hold the oscillator boards to help in locating them for tuning.

TUNING METHODS

A variety of tuning methods can be used to tune the oscillators in this organ. Any one of these procedures can provide excellent results. The accuracy of these methods is dependent upon the skill and care of the technician.

COMPLETE TUNING

When complete tuning is required, first tune oscillator 36. Attach voltmeter to RC oscillator tuning bus at top of R6 or R9. Adjust tuning pot at oscillator 24 for 5.5 to 6.0 volts. Do not readjust oscillator 24 or 36. To do so may cause oscillators 01 to 23 to mistune.

CAUTION

Do not loosen the nut on the holding spring on top of the ferrite core when making tuning adjustments.

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TUNING PROCEDURE

TUNING METHODS (cont.)

BEATING OCTAVES TECHNIQUE

This method works best when a majority of the oscillators are known to be correctly tuned and only a few oscillators are out of adjustment.

1. Play the note to be tuned and the note one octave higher or lower.
2. Adjust the core cap for zero beat.

STROBOCONN OR PETERSON TUNER

Either of these instruments facilitates a very accurate adjustment of the oscillators. Depending on the model of the instrument used, it may be necessary to tune the lowest and highest oscillators previously tuned with the electronic tuner. For best results, follow the directions provided with the unit.

CELESTE OSCILLATORS

NOTE: Insure that all oscillators are correctly tuned before beginning this procedure. By following this advice, Celeste Oscillators can be tuned by "beating" them against the Main Oscillators. (Not literally please!)

- A. Turn ON the 8' Viola Celeste on the Swell Division.
- B. Play keys 1 to 61 on the Swell Manual, one at a time, and tune CELESTE OSCILLATORS 1 to 61 using the procedure in the following steps.
- C. As each note is played, you will simultaneously hear a signal from the Celeste Oscillator and a signal from the Main Oscillator. The resulting Celeste "beat" sound is due to the difference in frequency between the two oscillators.
- D. Tune each Celeste Oscillator for zero beat and then rotate the cap of the core in the clockwise (sharp) direction until the proper number of beats are heard as follows:

TUNING PROCEDURE

CELESTE OSCILLATORS (cont.)

NOTES

BEATS PER SECOND:

1-12	1/2 beat at note 1 graduated to 1 at note 12
13-24	1 beat at note 13, graduated to 2 at note 24
25-36	2 beats at note 25, graduated to 3 at note 36
37-49	3 beats at note 37, graduated to 4 at note 49
50-61	4 beats at note 50, graduated to 5 at note 61

- E. If desired, the Celeste Oscillators can be tuned with either the Stroboconn or Peterson tuner. **BE SURE TO SET ALL CELESTE OSCILLATORS ON THE SHARP SIDE OF THE MAIN OSCILLATORS.** Adjust the relationship between the Celeste and Main Oscillators as follows:

NOTES

BEATS PER SECOND:

1-8	16 Cents
9-20	14 Cents
21-32	12 Cents
33-44	9½ Cents
45-56	7½ Cents
57-61	5 Cents

SUGGESTED VOICING PROCEDURE

for

RODGERS YORK 650, KENT 705, GLASGOW 740, EXETER 770 & ASILOMAR 780

Before beginning voicing procedures on any Rodgers organ, double check the following conditions.

1. Organ and speakers correctly connected (common wire terminals match).
2. Tweeter adjustments set at 1/2 to 2/3 open. (The larger and livelier the room, the more high frequency sound is needed.)
3. All channels are operating correctly (check channel listing).
4. All stops function.
5. Speaker placement is finalized.

It is necessary to have at least two people to voice any organ. If the console is located in an acoustically "dead" spot in the room, it is recommended that a third person play the organ allowing the voicer to listen from an advantageous point in the room while a technician makes adjustments at the console.

Critically listen to the organ prior to making any changes to levels (volume) or timbre (sound quality). The normal relationships between voices have become standard to allow the organ to play the literature properly. Do not change a chorus voice because someone prefers a change for a "special effect". Please read the owner manual's definition of chorus if any questions arise about its meaning relative to organ sound.

We recommend the following be used as initial test combinations: General 5 on the 650 and 705, General 8 on the 740, and General 10 on the 770 and 780. These are substantial full organ sounds. Open the Swell and Great Expression pedal(s) to the maximum position. Play on the Great Manual and pedals. Listen for power level and overall clarity. Continue playing, changing general pistons in decreasing order, then reverse the procedure.

The technician should have the back of the organ removed and should have located the output board. Using the charts in this guide, locations of the master channel level controls can be found. If the organ is too soft, these level pots should be increased equally. Then listen for brightness in each channel. Regulate the treble for each channel individually. Use the full spectrum of sound in each channel, e.g., Flutes at 8', 4' and 2'. Use both hands playing at least two octaves apart to maximize the full tonal spectrum. Regulate so the high frequency sound has a clear, transparent quality, but not a hard, brittle texture. If Mixtures sound in a channel, be sure to include them in the test registration.

A unique feature of these organs is the manual to pedal channel low frequency level adjustment. These allow foundation tone from the manual channels additional reinforcement, if needed. To evaluate, use a single 8' stop in each channel (in an individual procedure). Play a scale beginning at C 4 (note 37) moving down to note 1. If the bottom octave is too loud or too soft compared to the upper registers, adjust these level controls accordingly.

The following lists will give the technician the location for level controls of individual voices. Also included is a bar graph showing relationships between voices.

There are two additional procedures which will greatly affect the tonal qualities of the organ. With the microprocessor controlling the keying of voices, there are changes to individual stops that can be made from the keydesk side of the console.

INTER VOICE LEVEL ADJUSTMENT

To adjust the relationship of 8', 4', 2', etc. within a given voice, the following steps must be taken.

1. Place switch located inside the uppermost small circular opening of the microprocessor cover in the up position. The microprocessor cover is located close to the hinge end of the rack in the back of the console. Placing the switch in the up position enables the organ to accept modifications to its programming information.

2. Press the set piston and hold through the next two functions.
3. Press the Power button (the button will begin flashing).
4. Press General 1.
5. Release set piston.

Note: The LEDs on some stops will be constantly lit while others will be blinking. Blinking LEDs indicate that stop is sounding at its maximum level. A constantly lit stop indicates that stop is sounding at a reduced level. LEDs that do not light indicate levels that cannot be changed. To change the stop to the alternate level, press the stop tablet. Note that keys will not sound when the organ is in the voicing mode, so decisions on which stops are to be changed must be made prior to entering this mode. To return to the operative mode, press the power switch. The reduced level can be regulated by the level control marked R 5 located at the top of each audio keyer board. For the Exeter 770 and Asilomar 780 Swell Reeds the level control is R 13. It is wise not to have an extreme difference between full and reduced levels.

CHIFF LEVEL ADJUSTMENT

The chiff control is unique and flexible. To enter the chiff control mode, repeat the same procedure as above, but, in step 4, press General 2 instead of General 1. Select an 8' Flute voice on a manual. Play Middle "C" (note 25). A number will light up on the transposer indicator. The number indicates the intensity of the chiff. If a change is required, select the desired level 1-4 (soft to loud) and press note 25. You have now programmed the desired Chiff level FOR ONE OCTAVE. Repeat the procedure for each octave. Remember, the Chiff level in the lower and upper ranges is most noticeable to the ear and should be carefully regulated. The Chiff is programmed to have random chiff, so if there is not always continuous chiff, the system is not malfunctioning. To return to operative mode, press the power switch. (To program notes 62-95, turn off the 8' stop and turn on a 2' stop.)

EXETER 770/ASILOMAR 780 SEQUENCE

Please be cautioned that the level controls marked factory adjust are not to be touched by anyone other than a factory-trained technician with good operating calibration equipment and a factory specification sheet.

A suggested sequence for voicing the 770/780 is as follows:

GREAT PRINCIPALS

GREAT FLUTES

SWELL PRINCIPALS Compare to the GREAT PRINCIPALS

SWELL FLUTES Compare to the GREAT FLUTES

GREAT FLUTES (8', 4', 2') Compare to the PEDAL 16' Subbass

Turn on 16' PEDAL SUBBASS and beginning at Pedal note C 25, play downward. Listen to the change from Pedal C 13 to B 12 (Keyer Notes 1 and 012).

Set R 367 until the levels of both notes are identical. Repeat this procedure for the PEDAL 16' Principal voice using R 371 to set the level.

GREAT AND SWELL PRINCIPALS, FLUTES (Unison pitch only), and MIXTURES coupled to Pedal. Using the PEDAL 16' SUBBASS and 16' PRINCIPAL, adjust R 867 until a pleasant balance is attained.

Add the SWELL 16' CONTRE TROMPETTE, 8' TROMPETTE, AND 4' CLAIRON to the above ensemble. Adjust R 145 until a good fusion of Foundation and Reed tone is achieved.

CANCEL ALL STOPS

SWELL VIOLA CELESTE II. Adjust R 209. Turn it completely off. Gradually bring it up until both Unison and Celeste voices match in level.

GREAT KRUMMHORN Compare to the GREAT FLUTE 4'. The Krummhorn should be the dominant sound. Adjust R 588. procedure as on the SWELL VIOLA CELESTE II. Adjust R 588.

GREAT HARP. Adjust R 602. Compare to the GREAT FLUTE CELESTE I. The Harp should be noticeable, but not dominant.

SWELL OBOE 8' Compare to the GREAT KRUMMHORN 8'. The Oboe should be slightly softer.

SWELL VOX HUMANA 8' Compare to the SWELL GEDACKT 8'.
The VOX HUMANA should add color, but not dominate.
SWELL FESTIVAL TROMPETTE 8' Compare to the full GREAT.
A definite dominance of power.

FINALLY, REGULATE THE TREMULANTS.

PEDAL

16' PRINCIPAL (Notes 01-012) R 371
16' SUBBASS (Notes 01-012) R 367 (Individual note
level controls are located on the FLUTE (GT)
keyer board.)
32' CONTRE BOURDON (Notes 001-0012) R 367.

FOR INSTRUMENTS WITH PIPES.

PIPE PRINCIPAL EXTENSION R 369
PIPE FLUTE EXTENSION R 650

Where more than one voice is affected by a level pot, the voice used for chorus (ensemble playing) should be regulated first. e.g., Principals, Flutes, Swell 16', 8', 4', Reeds. Then the special solo voices, celestes and percussions should be regulated.

650/705 VOICING SEQUENCE

Suggested sequence for voicing the 650/705 is as follows:

GREAT PRINCIPAL
GREAT FLUTE Compare to the PRINCIPAL
SWELL TROMPETTE 8' Compare to the GREAT PRINCIPALS (8', 4', 2')
SWELL OBOE Compare to the TROMPETTE (somewhat softer)
PEDAL 16' SUBBASS - Turn on the stop and begin playing a downward scale from pedal note 25. Listen carefully when going from pedal notes 13 to 12 (Keyer notes 1-012). Adjust R 232 until the level is the same.
GREAT HARP Compare to the SWELL Flute. The Harp should be somewhat softer.
CELESTE AND TREMULANTS - Regulate CELESTE R 387 with much restraint listening to the GAMBA, PRINCIPAL, AND FLUTES to avoid excessive level. Please note that when any Mixture stop is drawn, the CELESTE will immediately disengage from the PRINCIPALS.

TREMULANTS

A Tremulant is a very subjective effect depending on environment, purpose, and personal taste. However, there are some basic concepts that aid in selecting a musical speed and depth setting. The Principals should have a light depth at a moderate speed of about 2-3 beats per second. The Flutes should be of slightly increased depth with about the same speed as the Principals. The Flute Tremulant Full should have a marked increase in depth, but not attempt to imitate the proverbial "warble" (excessive depth!) of a bad human voice. The Speed should not be in excess of 5 beats per second. Reeds should be somewhat shallow, but not fast. Think of the vibrato of a fine Oboe player as a guideline. Also, listen to the Reed tones at different pitch levels before deciding on a final setting.

On instruments such as the Glasgow 740, Exeter 770, Asilomar 780 and larger, where there are separate tremulant controls for each manual, never set any two tremulants at the exact same depth or speed. To do so creates a massive sound wave that is not the musical effect tremulants are designed to give.

CHORUS CONTROLS

The purpose of the chorus is to create motion in sound that is a natural phenomenon in a pipe organ. Use discretion when setting these controls. It is recommended that only someone very sensitive to sound make these adjustments. Again, do not regulate any depth or speed controls to identical levels.

Consult the output board chart for level control locations.

PUFF CONTROLS

As air sounds are an integral part of good organ voicing, do not forget to check their regulation. Select a stop from the Great Principals, the Great Flutes, the Swell Principals, the Swell Flutes and then listen to each stop individually, playing single notes and chords. If the puff is either inaudible or excessive, regulate accordingly. Please note there are two level controls for each voice with air sound. One for each volume mode (soft and loud). The Great 8' Principal is always in the loud mode, so it can be used for comparison on the Great voices. As a final test, register Flute and Principal Choruses and play on the Great manual and Pedals listening for Puff.

EXETER 770/ASILOMAR 780 LEVEL DIRECTORY

VOICE LEVEL POTENTIOMETER NUMBERS

GREAT (Voice Levels)

PRINCIPAL	R 394
FLUTE	R 840
FLUTE CELESTE (individual)	R 596
KRUMMHORN	R 588 (also affects Flute Celeste)
HARP/CARILLON	R 602

(Separate Harp and Carillon levels and separate sustain levels are located on the Harp-Carillon keyer board.)

GREAT (Low Frequency to pedal channel levels)

PRINCIPAL	R 991
FLUTE	R A12
KRUMMHORN, FLUTE CELESTE, HARP, CARILLON	R 974

SWELL (Voice levels)

PRINCIPAL	R 110
FLUTE	R 75
UNIT REED	R 145
GAMBA/OBOE	R 830

(Individual controls for level and oboe voicing located on keyer board.)

VOX HUMANA	R 228
FESTIVAL TRUMPET	R 174
BOURDON DOUX 16' (Nts 01-012)	R 81

SWELL (Low Frequency to pedal channel levels)

PRINCIPAL	R A27 (includes Festival Trumpet)
FLUTE/VIOLA CELESTE	R A32
UNIT REED	R A22
GAMBA/OBOE	R A17

SWELL (Low Frequency to pedal channel levels)

PRINCIPAL	R A27 (Includes Festival Trumpet)
FLUTE/VIOLA CELESTE	R A32
FLUTE/VIOLA CELESTE	4 A32
GAMBA/OBOE	R A17

PEDAL (Voice levels)

16' PRINCIPAL (Notes 01-012)	R 371
16' SUBBASS (Notes 01-012)	R 367 (Individual note level controls are located on the Flute (gt) keyer board.)
32' CONTRE BOURDON (Notes 001-0012)	R 367

FOR INSTRUMENTS WITH PIPES

PIPE PRINCIPAL EXTENSION	R 369
PIPE FLUTE EXTENSION	R 650

GLASGOW 740 LEVEL DIRECTORY

VOICE LEVEL POTENTIOMETER NUMBERS

MAIN OUTPUTS

PRINCIPAL	R 744
FLUTE/REED	R 724
PEDAL	R 734
ANTIPHONAL	R 781

INDIVIDUAL VOICE LEVELS

FLUTE	R 225
SWELL REEDS/STRING	R 96
(Individual controls for voicing and leveling are located on keyer board.)	
SUBBASS/BOURDON DOUX	
(Notes 01-012)	
	R 232
PRINCIPAL	R 174
HARP/CARILLON	R 244

TREBLE CONTROLS

REED	R 755
FLUTE	R 772
ANTIPHONAL	R 784

CELESTE CONTROLS

FLUTE CELESTE LEVEL	R 197
PRINCIPAL CELESTE LEVEL	R 143
CELESTE SPEED	R 400
CELESTE AMPLITUDE (Depth)	R 427
CELESTE LEVEL	R 387

MAIN CHORUS LEVELS

PRINCIPAL	DEPTH	R 596	SPEED	R 596
FLUTE	DEPTH	R 646	SPEED	R 640
REED	DEPTH	R 616	SPEED	R 620
SWELL FLUTES	DEPTH	R 576	SPEED	R 570

TREMULANT CONTROLS

PRINCIPAL	DEPTH	R 586	SPEED	R 580
FLUTE	DEPTH	R 630	SPEED	R 620
REED	DEPTH	R 606	SPEED	R 600
FLUTE TREM FULL	DEPTH	R 626	SPEED	R 632
FLUTE (SWELL)	DEPTH	R 563	SPEED	R 580
FLUTE TREM FULL (SW)	DEPTH	R 559	SPEED	R 557

YORK 650 AND KENT 705 LEVEL DIRECTORY

VOICE LEVEL POTENTIOMETER NUMBERS

MAIN OUTPUTS

PRINCIPAL	R 744
FLUTE/REED	R 724
PEDAL	R 734
ANTIPHONAL	R 781

INDIVIDUAL VOICE LEVELS

PRINCIPAL	R 174
FLUTE	R 225
SWELL REEDS/STRING	R 96
(Individual controls for voicing and leveling are located on keyer board.)	
SUBBASS/BOURDON DOUX (Nts 01-012)	R 232
HARP/CARILLON	R 244
(Separate controls on keyer)	

TREBLE CONTROLS

REED	R 755
FLUTE	R 772
ANTIPHONAL	R 784

CELESTE CONTROLS

FLUTE CELESTE LEVEL	R 197
PRINCIPAL CELESTE LEVEL	R 143
CELESTE SPEED	R 400
CELESTE AMPLITUDE (DEPTH)	R 427
CELESTE LEVEL	R 387

MAIN CHORUS LEVELS

PRINCIPAL	DEPTH	R 596	SPEED	R 590
FLUTE	DEPTH	R 646	SPEED	R 640
REED	DEPTH	R 616	SPEED	R 610

TREMULANT CONTROLS

PRINCIPAL	DEPTH	R 586	SPEED	R 580
FLUTE	DEPTH	R 630	SPEED	R 620
REED	DEPTH	R 606	SPEED	R 600
FLUTE TREM FULL	DEPTH	R 626	SPEED	R 632

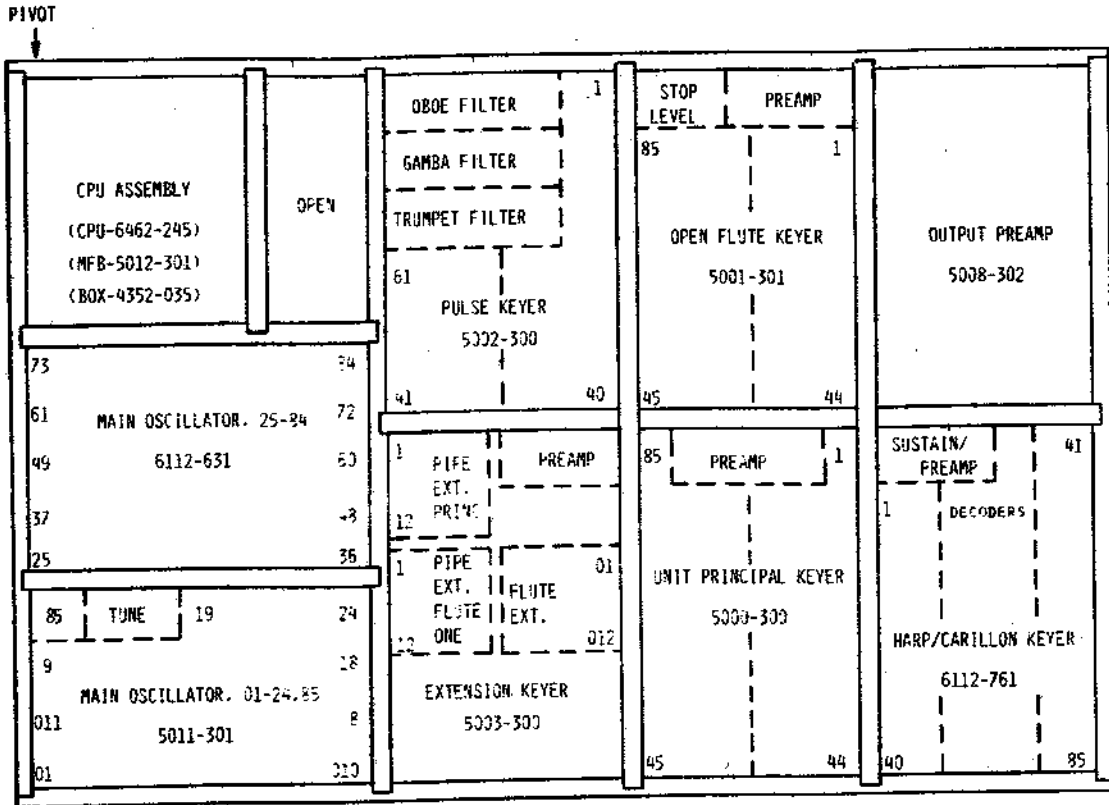
IMPORTANT

There are controls which affect the mixing quality of the Main Chorus. These are called bypass levels and are clearly marked on the layout chart.

In order for the Main Chorus to be effective, the bypass level must be at least 60%-75% of the level of the voice in its main channel. The bypass channel does not carry sound motion which is necessary for the Main Chorus to function correctly.

In cases where the organ is used predominately with tremulants, and the Flute Tremulant Full is also included, the higher frequencies in the bypass channel will not have noticeable tremulant. In these cases, it is recommended that the Flute bypass channel on the York 650 and the Kent 705 be reduced to under 50% of the Main Flute channel level. This will lessen the Flute Chorus effect, but will be more musically satisfying when the Flute Tremulant Full is used.

When tremulants are predominately used on the Glasgow 740, Exeter 770, and Asilomar 780, the Swell Flute bypass should be reduced and the Great Flute bypass remain at 60-75%. This allows the Swell to have the complete effective Flute Full Tremulant at the higher frequencies (where it is musically correct) while the Great Flutes provide the texture needed for the Flute sound when the Main Chorus is engaged.



PIVOT

COMPONENT SIDE

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REV.	ECO	DATE	BY	DESCRIPTION	ENG. APVL
RODGERS ORGAN COMPANY				SCALE	
				50%	
TITLE					
705 RACK ASSEMBLY					
DRAWN BY		CHECKER		DWG. NUMBER	
R. DOUGHERTY		SCHALK 7-15-83		1957	

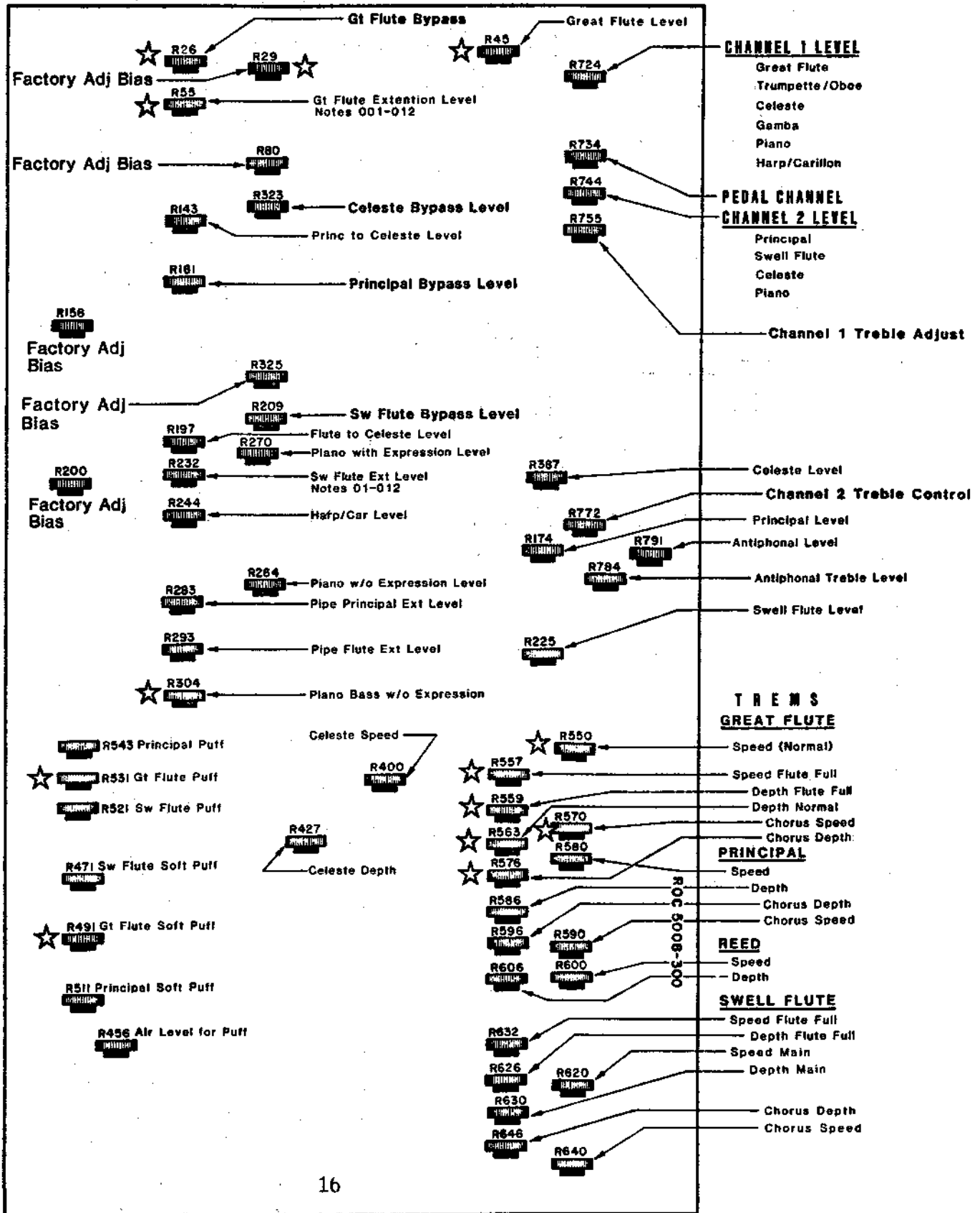
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7 6 5 4 3 2 1

J
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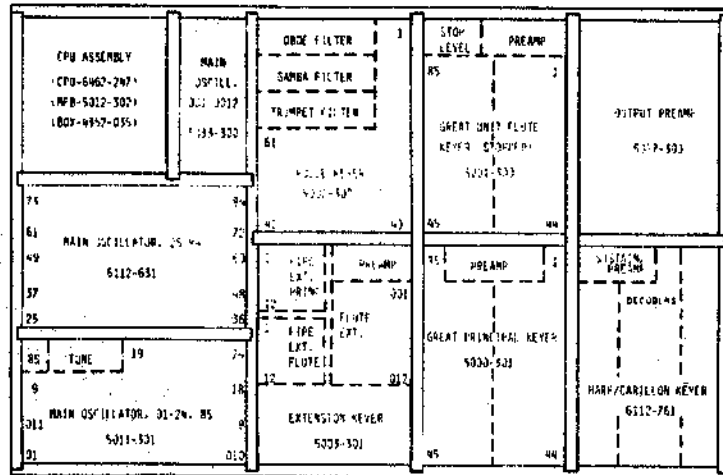
650,705,740 LEVEL LOCATIONS

CAUTION : DO NOT TOUCH POTS MARKED "Factory Adj Bias" AS MISADJUSTMENT WILL CAUSE DISTORTION.



PIVOT

RACK #1

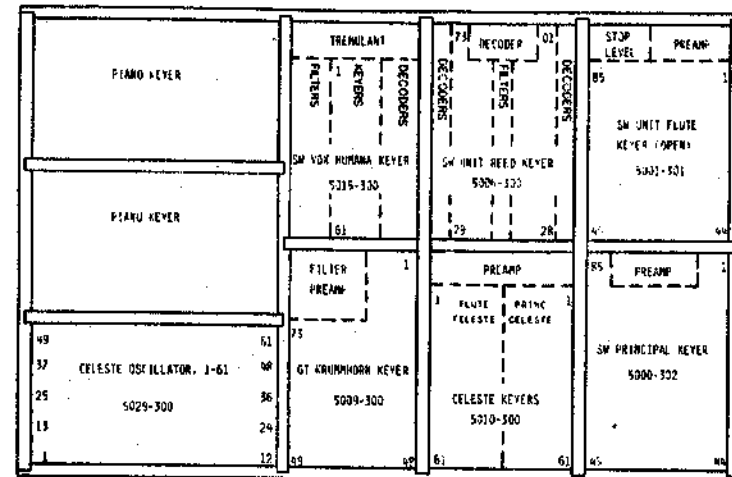


PIVOT

COMPONENT SIDE

PIVOT

RACK #2



PIVOT

COMPONENT SIDE

PRELIMINARY

REVISED BY	RELEASED	NO. APPROV. BY
RODGERS ORGAN COMPANY	SCALE 50X	
TITLE 770 RACK ASSEMBLY		
DRAWN BY R. Dougherty	CHECKER S. HALL 7-15-63	DWG. NUMBER 1000

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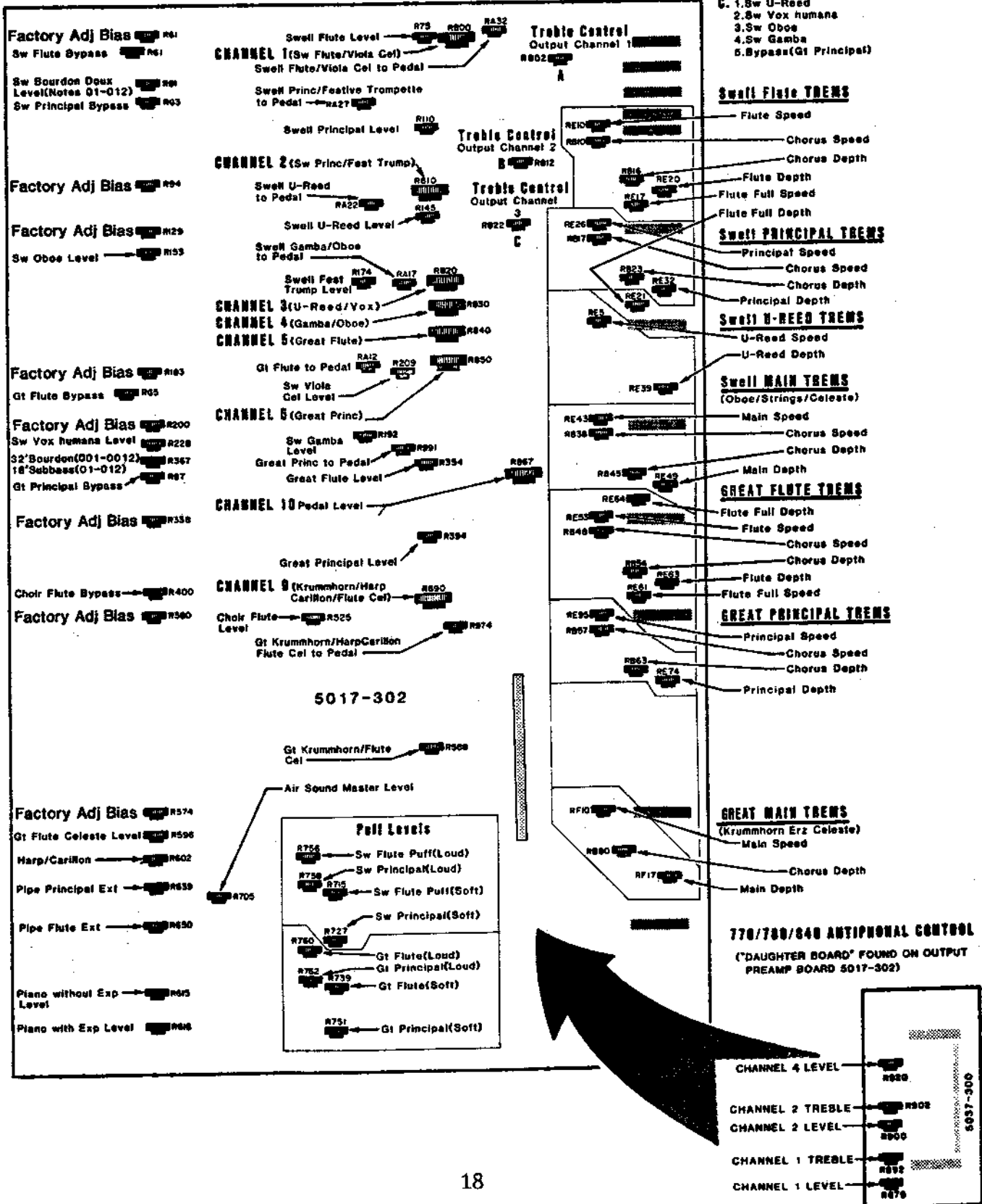
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770 LEVEL LOCATIONS

CAUTION : DO NOT TOUCH POTS MARKED "Factory Adj Bias" AS MISADJUSTMENT WILL CAUSE DISTORTION.

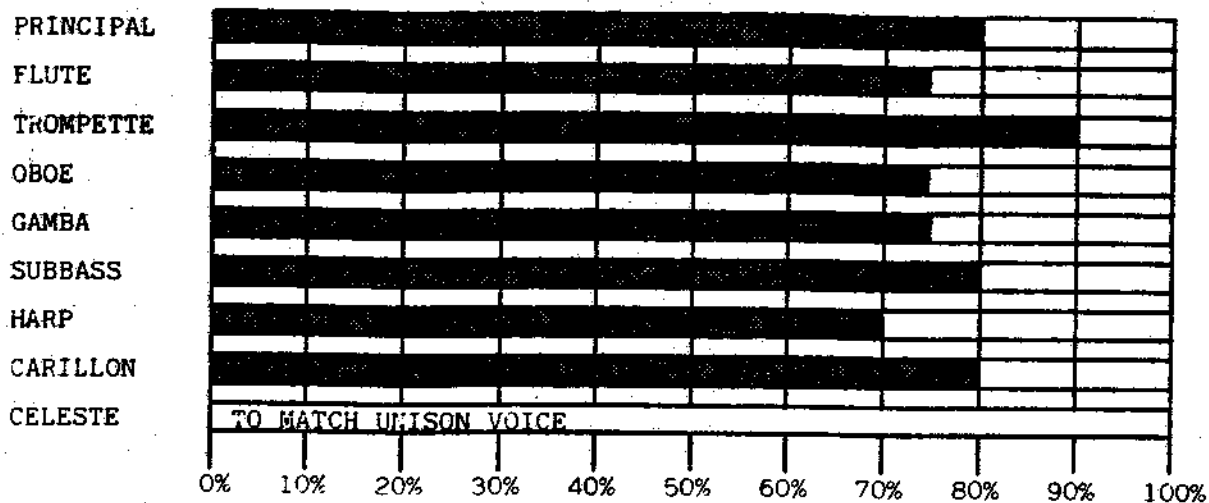
TREBLE Control List

- A.** 1.Swell Flute
2.Viola Celeste
3.Gt Princ
4.Gt Krumhorn
5.Bypass(Sw Princ Gt Flutes)
- B.** 1.Sw Princ
2.Festive Trumpette
3.Gt Flute Celeste
4.Gt Harp/Gt Carillon
5.Bypass(Sw Flute)
- C.** 1.Sw U-Read
2.Sw Vox humana
3.Sw Oboe
4.Sw Gamba
5.Bypass(Gt Principal)



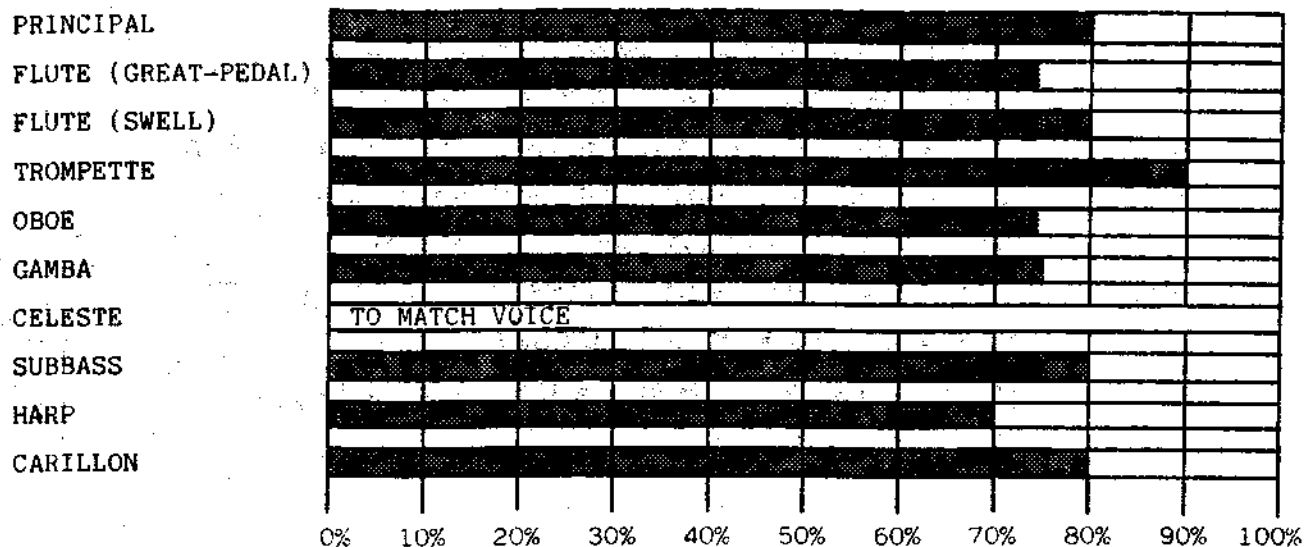
STOP LEVEL RELATIONSHIPS FOR RODGERS MODELS 650 and 705

The graph shows the fundamental level relationships between 8' voices played on the manuals at Middle "C" (note 25) and at the same note Middle "C" (note 13) on the pedalboard. This does not indicate chorus relationships, only single note.



STOP LEVEL RELATIONSHIPS FOR RODGERS MODEL 740

The graph shows the fundamental level relationship between 8' voices played on the manuals at Middle "C" (note 25) and at the same note Middle "C" (note 13) on the pedalboard. This does not indicate chorus relationships.



STOP LEVEL RELATIONSHIPS FOR RODGERS MODELS 770 and 780

The graph shows the fundamental relationships of voice levels between 8' voices played on the manuals at Middle "C" (note 25) and at the same note, Middle "C" (note 13) on the Pedals. This does not indicate chorus relationships.

GREAT

PRINCIPAL

FLUTE

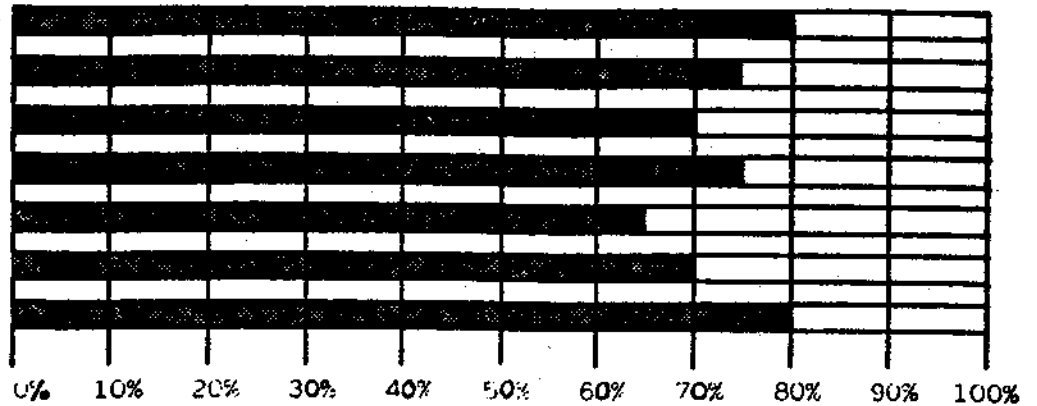
FLUTE CELESTE

KRUMMHORN 770

CLARINET 780

HARP

CARILLON



SWELL

PRINCIPAL

GEDACKT 770

TIBIA CLAUSA 780

GAMBA

VIOLA CELESTE II

FESTIVAL TROMPETTE 770

POST HORN 780

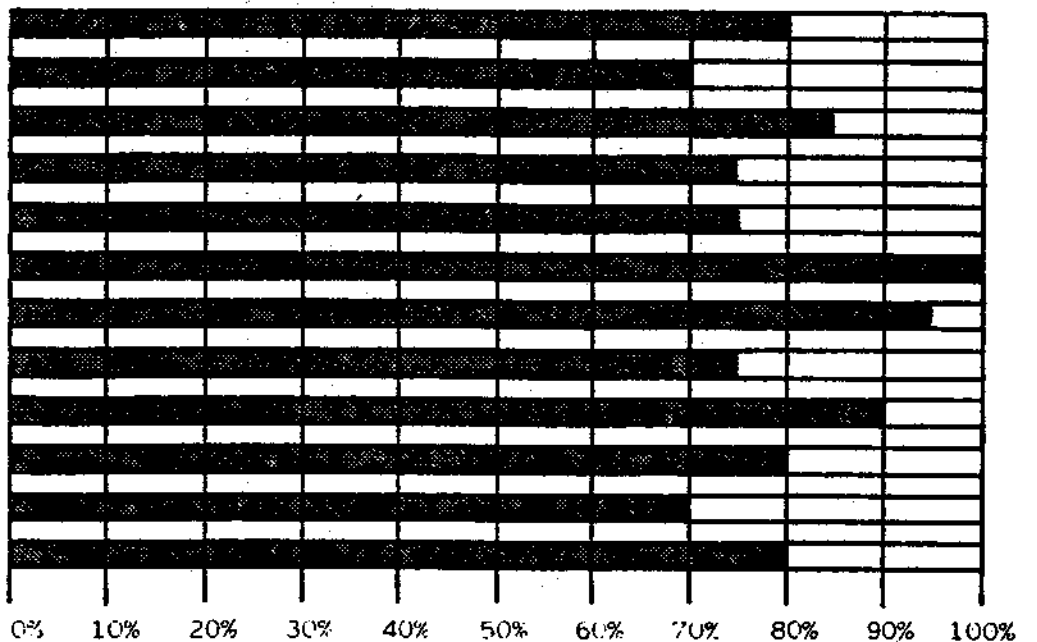
OBOE

TROMPETTE 770

HARMONIC TRUMPET 780

VOX HUMANA 770

VOX HUMANA 780



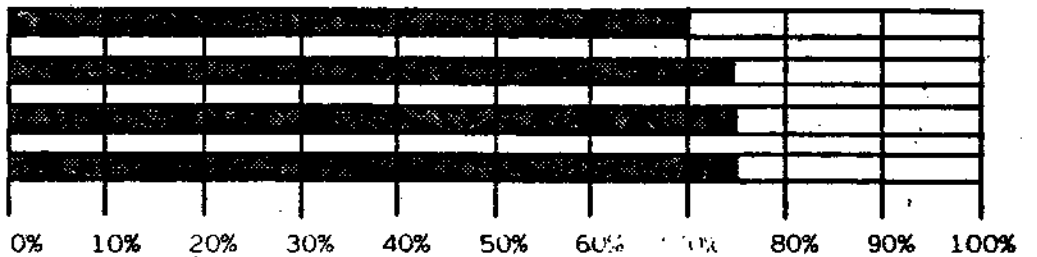
PEDAL

32' C. BOURDON

16' PRINCIPAL

16' SUBBASS 770

16' TIBIA CLAUSA 780



RECOMMENDED SPEAKER COMPLEMENTS

This is a general guide to speaker systems for the 650/705/740/770/780 organs. It is vitally important to good organ sound that an adequate number of speaker cabinets and amplifiers are used. If you are debating whether to add additional speakers, please do so, if at all possible. A large number of speakers driven at moderate levels is much more pleasing to the ear than a couple of cabinets being driven at near maximum power levels.

Remember when connecting speakers, check to see that each cabinet is in phase. This can be done by insuring the ribbed side of the zip cord runs to the same lead on each cabinet or by testing each cabinet with a small battery to insure a common direction of cone movement.

Recommended speaker complements are:

YORK 650/KENT 705

1. Internal Speakers Only - This is a three channel, 300 watt internal speaker system.
2. External Speakers Only - Disconnect the internal speakers and plug in the external speaker adaptor that is shipped with each instrument. You should now connect the following Rodgers cabinets:
channel 1 = M3, channel 2 = M10, pedal channel = P16.
3. Internal Speakers with External Antiphonal - Connect a Rodgers S101 amplifier to the single mixed antiphonal channel. No echo adaptor is required. This channel is controlled by the antiphonal stop tablets on the console. No adaptor is needed. An M3 is a good speaker for antiphonal use. If more power is needed use a Y-adaptor to connect two S101 and two speakers to the antiphonal channel.

GLASGOW 740

1. Minimum Complement - The Glasgow 740 is shipped with the following cabinets: channel 1 = M3, channel 2 = M10, pedal channel = P16. This is an adequate complement for small rooms.
2. Increased Pedal - In slightly larger rooms the following complement is suggested: channel 1 = M3, channel 2 = M10, pedal channel = P32.

3. Larger Rooms - For bigger rooms the following complement might be used: channel 1 = M3, channel 2 = M10, and M6 pedal channel = P32.
4. Antiphonal Cabinets - A single mixed antiphonal channel is provided. One or more S101 amplifiers must be used. No echo adaptor is necessary. M3 cabinets are suggested for antiphonal use.

EXETER 770/ASILOMAR 780

1. Minimum Speakers - Channel 1 = M10, channel 2 = M3, channel 3 = M3, pedal channel = S101 and P32. For home installations without chambers substitute a M10F, two M3Fs, and a P16F (finished cabinets).
 2. With Enhancement Cabinet - Channel 1 = M10 and M6, channel 2 = M3, channel 3 = M3, pedal channel = S101 and P32.
 3. Full Complement - Channel 1 (internal amplifier) = M10 and M6, channel 1 (external amplifier) = S101, M10 and M6, channel 2 (internal amplifier) = M3, channel 2 (external amplifier) = S101, M3, channel 3 (internal amplifier) = M3, channel 3 (external amplifier) = S101, M3, pedal channel = S101 and P32 or P1.
- Total cabinets = two M10, four M3, two M6, P32 or P1, and four S101 amplifiers in addition to the internal amplifiers.
4. Antiphonal Speakers - Add three S101s and three M3s to the antiphonal jacks. No echo adaptor is needed. Channels are the same as the manual channels except channel 3 includes pedal.