

 PRE*PIANO SERVICE MANUAL
I N D E X

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SECTION 1.0 -- KEYBOARD

The keyboard consists of the base-frame assembly and the key assemblies.

The base-frame assembly consists of a BASE FRAME or WOODEN CHASSIS; mounted transversely across its center is a strip of hardwood called the BALANCE RAIL; mounted vertically on the balance rail are 38 chromeplated, brass CENTER rail GUIDE PINS; mounted transversely across the front of the base frame are 38 FRONT rail GUIDE PINS.

The key assembly consists of 23 assorted WHITE KEYS and 15 BLACK KEYS. Mounted on the 15 black keys are the black plastic sharps. These may be reglued with such binding agents as "Miracle" cement obtainable at any 5 & 10 Cent Store, or any plastic aircraft type cement.

The white keys are capped with strips of pyralin "ivory", a product of DuPont, and standard equipment in piano repair shops.

Each key is slotted and each slot is capped with a FELT BUTTON. These buttons are slotted to allow a not too snug fit of key to guide pin.

REMOVING KEYS:

All keys may be removed simply by lifting the key off the guide pins. By grasping the key at the center rail guide pin this can be accomplished most easily. The amplifier must first be removed to remove keys under it. To do this do not touch the wiring. Merely remove the three nuts attaching the amplifier to the base-mounting studs with a suitable socket wrench. Then lift the amplifier off the studs and rest it on the tone-bar. Now all keys are clear. In replacing the amplifier, be sure to replace the ground clip.

KEYBOARD TROUBLE SHOOTING:1.) Sticking Keys

Keys may fail to return to their rest position due to three basic causes:

- a.) Interference with one another;
- b.) Tight felt buttons (rare);

- c.) Sloping front guide pin, binding inside clearance hole.

Since the third cause is the most common and easiest to correct proceed as follows:

- (1) Tap the front guide pin lightly backward (away from the player). Key need not be removed!
- (2) If this does not correct the trouble, view down each side of the key to see if interference with adjoining key causes trouble. If so remove key and file off interference point.
- (3) If felt buttons are too tight file, scrape or simply press apart inside surfaces of felt aperture. Scraping out inside of key aperture will also help in freeing keys.

2.) Loose Keys

Keys may be excessively loose due to:

- a.) Wear in the key buttons (Part 239-17)
- b.) Absence of key button
- c.) Short guide pins.

Corrections

Buttons may be tightened by applying aircraft dope to felt and squeezing aperture as the dope hardens.

If the button is excessively deformed it may readily be replaced by prying loose and glueing (with any quick-setting commercial glue) a new button in place. Care must be taken to position the new button in such a manner as to retain proper key spacing and movement.

If the guide pins are short, they may be extended by driving them up from underneath with light hammer blows. Excessive extension is undesirable since the key should not contact the guide pin top when depressed.

- 3.) SATISFACTORY KEY OPERATION may best be checked by raising the hammers off the keys with the hand. The key should then be free enough to return to its rest position, but should not be so loose as to permit adjoining keys to slap together under light side pressure.

SECTION 2.0 -- ACTION

The action assembly consists of two cast aluminum TONE BAR SUPPORTS; a laminated maple wood strip called an ACTION BAR to which is mounted 38 HAMMERS and 30 aluminum DAMPER STRIPS. Also mounted transversely across the tops of the damper strips and operated by the foot pedal is a strip of hardwood called a DAMPER RELEASE BAR. The damper release bar is mounted to the two tone bar supports by means of two damper bar pivot screws. (Part No. 1119)

Considered as a sub-assembly of the above is the HAMMER DAMPER ASSEMBLY consisting of the following parts:

- a.) Felt hammer head
- b.) Hammer shank
- c.) Hammer heel
- d.) Butt flange
- e.) Bridal strap
- f.) Aluminum damper strip
- g.) Damper felt

When hammers must be replaced, always replace the entire hammer

When hammers must be replaced, always replace the entire hammer damper assembly.

ACTION TROUBLE SHOOTING:

1.) Hammers Stick

Hammer may fail to operate due to:

- a.) Tight bearing in butt-flange
- b.) Interference between hammers
- c.) Wedging between tone reeds
- d.) Wedging against tonebar

CORRECTIONS

- a.) For tight bearings: remove hammer and damper assembly as follows: Unscrew damper strip, remove damper release bar, unscrew butt-flange and lift out hammer damper assembly. Now exercise hammer by moving up and down under tension on the pin-bearing. Hammer should move freely under its own weight. If exercise will not free hammer, install a new hammer-damper assembly.
- b.) Interference between hammers may be corrected by loosening butt-flange and rotating as required. If rotation does not suffice, replace offending hammer and damper assembly.
- c.) Hammers wedging between tone-reeds are either due to twisted hammer, (correct as in b.) above) or due to improperly located tone-bar. This latter is simply corrected by moving tone-bar laterally, making sure that all hammers strike tone reeds properly.
- d.) Hammers wedged against tone-bar are also corrected by moving tone-bar, in this case forward just enough to free hammer.

2.) Hammers Miss Tone-Reed

Hammers wedging between tone-reeds are either due to twisted hammer, or due to improperly located tone-bar. The latter is simply corrected by moving tonebar laterally, making sure that all hammers strike tone-reeds properly.

3.) Hammer Creates Rapping Noise:

May be due to loose bearing, (replace hammer as described above) or may be due to split hammer or broken glue joint. Replace split hammer, repair or replace broken glue joint.

4.) Dampers Do Not Operate Properly:

When properly adjusted the dampers should deaden all sounds immediately upon the release of the keys by the fingers. If tone vibration lingers after the fingers have been released, it is an indication that the damper felt is not wedged tightly enough against the reed. This is corrected by bending the front tip of the aluminum damper strip slightly upward.

In a properly adjusted instrument, with the keys in a depressed position, all dampers should release completely and all struck tones should be free to vibrate for their full natural duration. In the event that one or more of the vibrations dies out too soon after the initial strike, it is an indication that the damper is NOT releasing. In this event bend the front tip of the aluminum damper strip slightly downward.

Great care should be used in bending the strips, so as not to destroy their spring action. Should this occur, replace the

to destroy their spring action. Should this occur, release the strip mounting screw, straighten the strip, replace and reset.

PEDAL ACTION:

Pedal action is controlled by the length of the pedal rod (Part No. 1124). Proper pedal rod installation is described in the installation instructions. The correct length is determined by inserting the rod through the hole in the piano base until it contacts the damper release bar. Now the lower end of the wooden rod should be flush with the top surface of the pedal heel. If this is not the case, adjust the rod to suit by turning the machine screw in or out.

More recent model pianos have two holes in the piano base for interchangeability between the chrome stands and the wooden stands. Adjustment and operation for both is similar.

NOISY PEDAL:

Noisy pedal operation may be due to a loose bearing (see Section 6.0), improper rod length (permitting slack) or due to the pedal striking the floor. The simplest correction for the latter consists of inserting felt strips into the pedal housing in such a way as to restrict the pedal travel to prevent contacting the floor.

SECTION 3.0 -- TONE BAR (Part No. 239-13)

The tonebar assembly consists of 38 tuned tone-reeds pressed into the cast iron tone bar and of the amplifier pick up bar rubber-mounted between tone bar web and tone-reeds.

tone bar trouble shooting:

- 1.) Tone-reeds cannot change their pitch unless they are damaged. Consequently a tone bar once properly tuned will always be properly tuned. However, occasionally a reed may require replacing, may be damaged, or the owner may wish to alter the basic chromatic scale. Therefore:

To change the pitch of a tone-reed

 - a.) Shorten the reed with a file to raise the pitch;
 - b.) File a notch approximately 1/3" from the free end transversely across the top to lower the pitch.
- 2.) Do not bend the tone-reeds since this will shorten their life. Excessive bending, violent shocks, etc. will cause tone-reeds to break off.
- 3.) A tone-reed may be replaced by removing the tone bar, driving the shank of the reed out of the casting, inserting a new reed, aligning the flat face of the reed shank at right angles to its former position, (to assure a tight fit) and hammering into place. The reed must then be tuned. Reeds are identified as Part No. 239-13-1 to 38, -1 being the lowest note, and -38 the highest.

It is recommended not to replace tone-reeds unless you are thoroughly familiar with the operation, but rather to exchange the entire tone bar at the factory.

4.) ADJUSTMENTS TO THE TONE BAR

The tone bar has been locked to the support bracket by wooden dowels, to prevent displacement during shipping. These dowels are necessary only when the piano is to be moved frequently from place to place. They also provide a rapid method of repositioning the tone bar, if it has been removed for any reason.

In the event that a tone bar is to be replaced, the new tone bar will normally not fit the dowel holes already provided in the support. If the dowels are desired (for portability) new holes may be drilled AFTER properly positioning tone bar. (Recommend

using 3/16 dia. hardwood dowel, #12 drill through tone bar and bracket). In some instances the dowels themselves restrict, to a slight degree, the full tone of one or more notes. For maximum "ring" of all notes it may, therefore, be desirable to remove the dowels.

The mounting of the tone bar is extremely critical to the tone quality of the instrument. When making any adjustments observe the following precautions:

- a.) TREBLE hammers must strike the tone-reeds as near to the throat, (tone bar flange) as possible without wedging. To permit accurate positioning, the tone bar has been slotted. (See Sec. 2.1)
 - b.) For proper resonance, the mounting bolts attaching the tone bar to the supports may not be drawn up too tightly. The tone bar must be firm but not clamped between the rubber grommets. Tighten bolts while playing instrument to determine proper bolt tension.
 - c.) Check all hammers to determine proper lateral position of tone bar. (See Sec. 2.2)
 - d.) Check all dampers for proper operation. (See Sec. 2.4)
- 5.) Installing a new tone bar:

Observe all precautions enumerated above. Be sure to mount tone bar between rubber washers. Be sure to adjust dampers as required.

Amplifier lead must be tightly connected to the pick-up bar, and the shielding grounded by a spring clip to the tone bar.

Occasionally a new tone bar may result in reeds vibrating against the damper release bar. In this case shave off damper release bar as required and/or bend spikes away from release bar (only if necessary).

- 6.) The Pick-up Bar can be the source of many electronic troubles. The plastic screws by which it is mounted determine the volume, (screwed in--low volume, out--high volume). Excessive tightening will cause hammer "shock" noises, and may break the screws. We recommend not adjusting the pick-up bar unless fully qualified. In the event of trouble we suggest exchanging the tone bar assembly.

SECTION 4.0 -- AMPLIFIER (Part No. WE3A)

- 1.) The amplifier assembly consists of four parts: amplifier, speaker, tone pickup bar and output jack. The amplifier is a straight, cascaded resistance capacitance coupled audio amplifier, working single-ended into speaker. There are three tubes consisting of one rectifier tube 6 x 5 to supply DC voltages from the AC line. One dual triode, triodes cascaded to supply voltage gain necessary to drive 6V6 beam output power tube. Circuit is entirely conventional except for electrostatic pickup bar polarizing voltage and degenerative feedback which is incorporated on all tubes by leaving cathode resistors unbypassed to reduce harmonic distortion. Operation of amplifier is as follows: a polarizing voltage is applied to tone pickup bar mounted on underside of plate, close to reeds, through an 18 megohm resistor. The changing capacity in the pickup bar reed combination occasioned by vibrating the reeds in playing, causes electrons to pile up and recede at juncture of 18 megohm resistor and pickup bar reed. This varying voltage is applied through .01 capacitor to grid of 7F7 where it controls current flow in first section of 7F7. The voltage which is occasioned by the piling up of electrons on the 18 megohm resistor is so small that it is further amplified in similar manner in that second 7F7 section--where it then drives the 6V6 output tube to give loud speaker volume. The closer the pickup bar is set to reeds the louder will be the tones; however, resultant shock noises and slow motion movements of the reed limit gain, which may be accomplished by this means. A satisfactory adjustment of the spacing is of necessity that one which is most plea-

sant to the ear and which affords the same volume on all tones.

- 2.) For lowest HUM LEVEL the AC plug, (the wall plug attached to your Pre*Piano) must enter the wall socket one way only. Try both possible positions and ascertain which gives you the lowest hum level.
- 3.) ADDITIONAL AMPLIFICATION (through your radio-phonograph, separate amplifier, etc.)

Your Pre*Piano has a socket on the underside of the case on the aft right hand side of the instrument. A shielded separate cord is available to plug into this socket in order to connect the Pre*Piano to any type of outside amplifier or radio-phonograph combination.

Depending on the application (radio-phonograph, separate amplifier or public address system) this cord may require special plugs, and for this reason it is considered an accessory.

The standard 6ft shielded cord will carry part No. 239-11-1. Any special application may be prepared by your dealer, radio technician, or write to the factory.

On the drawing supplied, some points have been marked "x" or "y". The output jack connection "Y" is circled. As it is impossible to make a connection which is suitable for all re-amplification requirements, one has been chosen which seems to us to be the most likely to be satisfactory. Other points however have been marked on the drawing which might be more suitable in some applications. All "y" connections would be for high impedance outputs. Those marked "x" could be used for a cathode follower.

4.) Amplifier Troubleshooting:

Many amplifier troubles can be repaired by a layman, some require a technician. When troubles occur it is important to localize correctly the source between the three separate units:

- a.) Amplifier
- b.) Loudspeaker
- c.) Tone bar assembly

Unless experienced personnel is available, we recommend exchanging any of the above three units which prove to be faulty, except that the tubes of the amplifier should of course be replaced separately if they are at fault.

Distortion in the tone quality such as loud, resonant tones, sounds similar to mechanical rattles, fuzzy echos after striking tones, muffled hammer clunks are practically all due to maladjustment of the pickup bar which should be separated from the plate upon which it is mounted by pure rubber grommets and under sufficient tension to hold all parts firmly. Too much pressure causes hammer clunking and too little pressure causes rattles due to pickup bar vibration. The pickup should be held in place by plastic screws threaded into pickup bar.

Resonances, however, which are identified by notes louder than others in bass section, may be due to breakdown of speaker cone; rattles also similar to pickup bar vibration may be caused by speaker cone breakdown. To check for speaker cone breakdown hold cone of speaker firmly with hand while striking tones. If rattle is eliminated, speaker change is advised.

Mechanical rattles of loose parts, or screens in the piano, or rattle due to 7F7 touching plate or having loose elements in tube, may occur. Correction: tighten loose parts or replace 7F7. 7F7 rattles are usually identifiable and are described previously as fuzzy echo after striking tones. Thumping 7F7 tube will duplicate sound you are looking for, if this is the cause.

Some amplifiers have 6N7 tubes in place of 7F7's. They are similar type tubes and directions for 7F7's also apply to 6N7's.

A sizzling sound varying from that of frying bacon to the slow tick of an electric clock, is due to leakage in pickup bar,

or pickup bar lead, or components in can #1. To isolate trouble, remove pickup leads from pickup, turn amplifier full on. If sizzling or ticking is still present, a radio technician is required to repair amplifier. If it does not persist, sound is due to poor insulation of pickup bar. Rubber grommets should be of pure grade rubber as supplied by us. Leakage may be due to dirt or to screw of main pickup connection being too close to metal. Careful installation should correct trouble. NOTE: Due to high gain required, some frying or sizzling can always be detected. This however is at a minimum when the instrument is shipped. It goes up and down with the volume control and should not be objectionable when instrument is played.

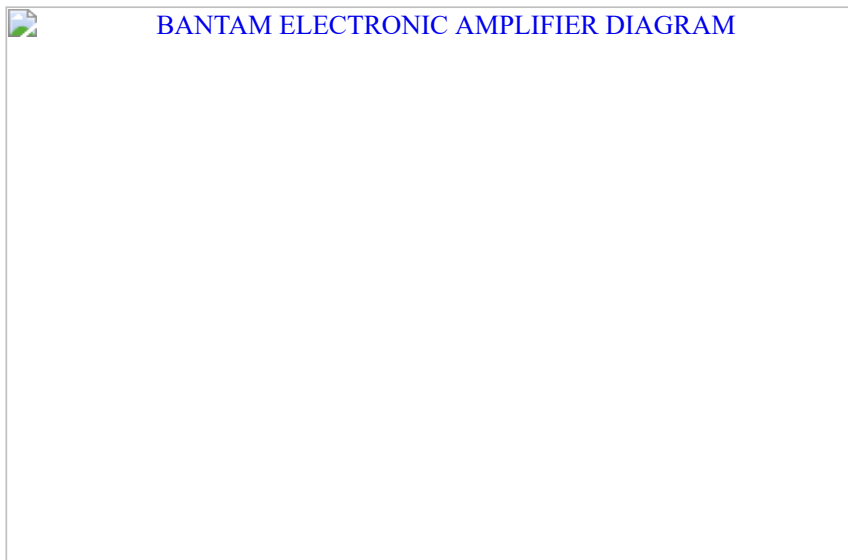
Hum may be picked up from other electrical equipment such as fluorescent lights, signs, etc, or may be due to breakdown of amplifier. To minimize pickup hum, check screen in bottom of the piano to make sure it is grounded by bolt which passes through base of screen and has brass clip above amplifier bearing on amplifier chassis. Be sure bolt goes through screen and that clip touches amplifier chassis. Be sure tone bar is grounded by foil tape to tone bar supports over rubber mounting grommets. If correction of these possible sources of trouble does not correct hum, disconnect tone bar from amplifier. If hum still persists, trouble is in amplifier and radio technician is required.

Acoustic feedback is a sound which grows in loudness after a tone or chord has been struck. Violent rattle of the piano top may follow. This may be corrected by the layman by making certain that the following clearances are observed: top should not touch pickup cover cap or power transformer in amplifier. Volume control chassis should be free in hole. 7F7 tube should not touch tone bar. Amplifier chassis should be loose, be rubber mounted and should not touch piano pins. Pickup bar should not set too close to spikes. Resonances previously discussed should also be corrected as they cause acoustic feedback. Feedback, though rare, may be due to faulty amplifier or loose elements in 7F7. If all of the above precautions have not eliminated feedback, try a new 7F7. If this fails, get a radio technician.

Low-Pitched vibrations of Treble Notes which decrease in pitch with the notes, are caused by hammers striking reeds too far out. Correction is to move plate as far towards speaker as possible when locking in place. Also adjust pickup bar for lower volume at extreme treble end.

These low tones are also increased in volume by too much tension on plate mounting bolts. Rubber washers under plate to some extent minimize the trouble. On plates having rubber mountings, some control of the tone quality can be exercised by tensioning the plate mounting screws. The results can be attained by playing the full keyboard, one note at a time, checking all notes by ear and adjusting tightness for a suitable balance. Locking treble end down tight will deaden extreme treble notes; locking bass end down will deaden middle treble notes. A considerable degree of freedom for the plate is required to get optimum results. Experimentation with the above suggestions should very rapidly make the layman quite skillful in bringing out the best quality of tone in the instrument.

BANTAM ELECTRONIC AMPLIFIER DIAGRAM



TO CHANGE OUTPUT JACK TO LOW IMPEDANCE:

Disconnect the two wires connected to output jack and the 2 wires connected to the speaker. Extend the 2 speaker wires and solder them to the output jack mounts. Other high impedance outputs shown marked "Y". Cathode follower outputs marked "X".

SECTION 5.0 -- CASE

The mahogany case and key-rail are mounted to the Pre*Piano by screws on the under-side of the base.

To remove the case, remove the three mounting screws, remove the volume control knob, grasp the corner posts with both hands and rotate the case upward and toward you until it slips off the volume control and is free. Replace in the same manner by first inserting volume control into case-aperture and rotating into place.

Removal of the case is simplified by removal of the key-rail, but this is not necessary.

The case should require no servicing, except the normal care awarded high quality furniture.

SECTION 6.0 -- STAND

No servicing should be necessary for the stand, with the possible exception of the foot pedal assembly. Excessive wear might cause looseness in the bearing. This should be corrected by drilling out for a larger pin.

SECTION 7.0 -- PARTS LIST

(Only those parts which are removable and can, therefore, be replaced are shown. Standard hardware and felts are not listed.)

<u>DESCRIPTION</u>	<u>PART NUMBER</u>
Chrome stand assembly (includes seat)-----	D5-288
Seat (Chrome stand)-----	D5-288-8
Pedal Rod-----	1124
Piano Assembly-----	239-1

Piano Case -----	239-10
Front Rail (Keyboard Molding)-----	239-10-20
Spacer Bars (Chrome stand mounting rails)~-----	B5-279
Tone Bar Assembly-----	239-13
Tone Reeds-----	239-13-1 to 38
Amplifier Assembly (including all electric wiring--not including loudspeaker)-----	ME3A
Tubes-----	7F7 6V6 6X5
Loudspeaker-----	6MGM 1
Cord (6 ft. shielded)-----	239-11-1
Piano Keyboard	
White Keys--End Keys	Bass-----239-15-1
	Treble-----239-15-2
	C-----239-21-1
	D-----239-21-2
	E-----239-21-3
	F-----239-20-1
	G-----239-20-2
	A-----239-20-3
	B-----239-20-4
Black Keys	
	C# and D#-----239-21-5
	F#, G# and A#-----239-20-5
Black Plastic Sharps	
	C# and D#-----A5-277-1
	F#, G# and A#-----A5-277-2
	Key Buttons-----239-17
Felt Leveling Washers-----	Commercial Product
Piano Action Assembly	
Hammer-Damper Assembly (includes dampers if required, and flanges)	
Treble - no damper-----	239-19-3
Intermediate - no damper-----	239-19-2
All Others (with dampers)-----	239-19-1
Hammer Flanges-----	1120-1
Damper Release Bar (Chrome stand)-----	B5-271
Damper Release Bar (3-legged stand)-----	239-22
Damper Bar Pivots-----	1119
Damper Release Bar Spring-----	1126
Tonebar Supports	
Left hand (bass)-----	C5-296
Right hand (treble)-----	C5-297
Piano Stand Assembly (3-legged wood)-----	239-16

Left Brace-----239-16-3
Right Brace-----239-16-4
Front Legs-----239-16-1
Rear Legs-----239-16-2
Piano Seat (4-leg wooden)-----256

U. S. PROPELLERS, INC., 3270 EAST FOOTHILL BLVD., PASADENA 8, CALIFORNIA