

**The Bear Notebook
For OBA Acceptors
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You may deliberate about reading these notes and think it will be a waste of time, or you may think it will be over your head but you will find "Bear intellect" is a collection of simple items stacked on one another. The information includes guide lines and do-ie knowledge which s based on common sense.

Rowe OBA bill acceptors have been around for many years and are still being used today. Rowe has seen fit to update the OBA-2 series of control units. These include single board Juke box, BC-1 bill changer, later double board units which use a single processor [and **does not** have a separate 24 pin prom on the board] to accept the new \$5 bill so the OBA may be around for many years. Rowe also has an update for the OBA-4. Since updates exisit ll attempt to present meaningful information about the OBA acceptor. If you plan to do one of the updates be advised that you should be capable of removing a 40 pin IC and then you can install the updated IC mounted on an adaptor board. It is not a plug in modification.

As always the overall long-term performance of an OBA will depend on how good of a job you do on rebuilding the OBA and how much preventive maintenance you give to the acceptor. If you have read my other articles, you

know preventive maintenance is a must.

You should read the material which is in my articles in The Magic Wand, FEK/Motor Test Unit, and the magnetic Head articles. Even if you do not have any Rowe equipment read'em because a lot of the information is general in nature and some of the material may apply to what you have to work on or how you do things.

Let me say one thing up front. With my order of doing things I prefer to use Rowe factory parts rather than other replacement parts so you will not see me writing about them. This is not to say you cannot reduce costs, et cetera, by going that route but since I have not used these other parts I have nothing to say about them.

In the last 22 years I have rebuilt many OBA acceptors and seen changes Rowe has made over the years. The type of belts used on the OBAs has changed many times over the years but that is all past history which we can put aside that history because in rebuilding the OBA you will be using today's black shiny lower timing belts and the upper clear belts.

Most OBAs old or new they are basically the same except for a few minor changes like the cover for a 4900 vending machine. For special installations, the lower front mounting plate was cut short and it does not have the lower mounting holes. The nostalgic jukebox with an OBA acceptor has this short mounting plate. The OBA is different than other OBAs. The OBA-4 that is a \$1, 5, 10, 20 bill acceptor. This

acceptor has an added sensor down inside the backside and a different interface board. Be careful you can pickup an OBA-4 and think is a \$1 - \$5 OBA and you can force plug a normal \$ 1, \$ 5 OBA cable into an OBA-4 acceptor. The \$ 1-20 OBA-4 has a white metal piece on the bottom of the cover.

The CD100A jukebox uses an OBA acceptor and its manual has the latest information for an OBA and it includes break downs for shafts and roller assemblies. If you need part numbers etc, use the CD100B volume II manual. I will include my work sheet at the end of these notes as a reference for some of the part numbers.

As far as I am concerned the key to doing a long term rebuilding job on an OBA is the worn shafts have to be replaced. Cleaning the roller holes with a cleaner and wire gun brush is another must. I use a .25 cal gun brush ground down slightly. I screw a little ¼' metal handle on it and then I can put it into my very slow speed nut driver. Just changing the belts is just a short-term compromise. I reassemble the cleaned rollers on new shafts with a little drop of lubricant. It does not make sense for me to rebuild an OBA where the shaft coating is chewed up and worn. More of the coating will simple flake off the shaft once the wear has started.

Because E or C clips are made by pressing them generally one side is smoother the other side so I made sure the smooth side faces the nylon roller or in the case of the input and rear drive shaft the E clip faces the nylon bearing

You will read about certain updates which should be made when you rebuild an OBA and one I don't make.

One of the major concerns is the damage that you can cause when screwing and un-screwing the magnetic head assembly. The original OBA acceptor had a head assembly which had metal inserts imbedded for the assembly where the mounting screws would go. As time went on Rowe dropped the metal inserts and just left a hole and started using sheet metal type hi-low screws. Sometimes handling of the screws in the head caused damage to the assembly. Rowe then designed a wire spring to hold the assembly in place. After a little more time Rowe made the spring with the longer back end of the spring a little bit shorter.

Since no screws are to be used to hold the **later** head assembly in the OBA the rear bracket for the 4900 vending machine was modified so you did not have to put screws into the newer head assembly. A screw slot [or you can drill a new hole] was provided in the bracket so you can use a single screws to hold the lower part of the bracket in place. For the single board 4900, the newer bracket part number is a 3-08785-01 but ask for the slotted opening because both kinds maybe in the parts box.

I will attach a page for lubricating the OBA and drawing of the 4900 bracket.

If you have the original head assembly with the metal inserts you want to make sure you push down the top of the assembly when you tighten the top screws. The backside of the assembly wants to be pulled back away from the

OBA when you tighten the back screws.

Along with the new assembly came another important change you really want to make. Once in while an older OBA would eat a bill. This was caused when the anticheat level was be pushed way into the rear sensor and lever would end up going to far and the sensor would think the sensor was no longer blocked by the anticheat lever. The problem got a little worst with the new head block. To prevent this from happening a new anticheat lever was designed which has a little extended tab area which keeps the sensor always blocked when an anticheat was pushed into the sensor. If the acceptor does not have the modified anticheat lever get a new anticheat lever. Over the years another problem came up with the anticheat spring. For a while a stiffer spring showed up which caused back end bill clearance problems. Rowe went back to a lighter spring tension and painted it blue. Therefore, along with the new anticheat lever you also want the blue or lighter tension spring.

The rear sensor can be replaced and if you have an older OBA you will want to take note of the sheet you get with the sensor. The color code may not be the same as the one you are replacing.

The OBA lower track was revised a few times. The new track is held in place by two hi-low screws. There is a up-side-down U slot in the track for the Anticheat shaft. You can crack/break the plastic U slot when removing or installing the anticheat shaft. To remove the anticheat shaft correctly and prevent breaking the U slots first remove the

front belt shaft and spring/s to get the upper belts loose. Remove the creasing roller shaft, with the belts loose, you can slide the anticheat shaft down and out of the U slots. Once the anticheat shaft assembly is put back in place, you can replace the top front shaft, spring/s and the rear-creasing shaft. Make sure the creasing rollers are aligned correctly. If you put the oller on the wrong way or reverse rhe shaft the roller can force its way into belt and sprocket on the lower belt shaft and maybe even break the sprocket, The creasing rollers must be loose so they can roll freely. There have been some cases where I do not have enough free movement of the creasing rollers, In this case, being careful where the chips fly, I Dremel the hole/s in the OBA side/s enough so I can move the shaft back and give the roller complete freedom. You can problems with the rear creasing roller alignment. Another Bear thingy for you: There is a check you should make when testing the OBA, turn it upside down and put the bill into the OBA. Watch the bill as it comes out and up out of the OBA. It should not lean to either side. If it does re-alignment the creasing roller shaft and/or Dremel the shaft holes if required. Improper alignment can affect the way the bill is stacked it may not be pushed back out of the acceptor if the bill did not pass the acceptance tests. Bills can get hung up in the back end of the OBA and may get pushed into the bill box but not stacked until the next accepted bill comes along.

When a lower track U slot is broken the anticheat can bind or get caught on the tabs which stick out of the lower back. To fix it, replace lower track or use something like plastic steel to repair it. sometimes you will find, even on a good track the anticheat will catch on the track. Some older lower tracks have a solid area where the anticheat shaft goes. You will need a short shaft that is the same length front shaft. The majority of the lower tracks have the upside down U shape slot. The longer shaft touches the metal sides of the acceptor. You may either have a short or longer haft for the anticheat shaft depending on the lower track used.

I normally do not have trouble with older lower tracks and the new anticheat lever but in some cases, the anticheat level hit the lower track that was bent. The bend in the lower track keep the anticheat lever in the light path. In worst-case conditions, you may have to replace a deformed or broken lower track. It will not happen often but keep it in mind.

Another change on the OBA was the arrangement for holding the front shaft in place. Originally, the front shaft was held in place with screws on both sides and later Rowe went with two-nylon busings and a wire spring. This may have improved performance but over the long term I started to see problems. The upper back end of the inlet could be moved up and bring the front shaft away from the upper rubber roller. Some were found where the bill would not be pulled into the acceptor. You can loosen up all the screws in the front of the OBA and push the inlet back

down in place and tighten all the screws but sometimes when the OBA was handled or mounted the problem would occur again. My personal position is to go back to original screws to hold the inlet and shaft in place and the problem goes away. The later version of the inlets did not have the hole for the front shaft screws but the side plates do have the holes so using these holes has a guides I make sure the inlet is down in place and drill holes in the inlet. Now I can use screws to hold the front shaft in place. I make sure not to get the metal drilled particles on the pressure roller. I do my drilling with the OBA upside down. After I am done, still holding the OBA upside down I air hose away any particles left from the drilling.

Another change may was the way the motor belt tension is made. Originally, a pin and roller was used to make the adjustment. One problem I have seen with the original roller adjustment setup is when I see someone has worked on the acceptor and they did not know on what side of the belt the roller goes. Somehow, the roller ended up on the middle of the belt riding on the teeth of the belt rather than to outside of the belt where it belongs.

There are a few failure items to be aware of besides those covered in the other articles. The connectors on the bottom interface board connection can break loose and have bad connections. They can be cleaned and resoldered. If the connector is broken or the pins are can not be cleaned you may have to replace the connector. When soldering the connector you can clamp it tight to the interface board. The interface board

has connectors on it and you may find the copper and/or connectors are bad. Damage may have been caused by salting of the acceptor.

Salted acceptors: Generally a lot of damage is done when an acceptor gets salted and one of the items that might be damaged is the pressure roller/s assemblies. Some of the damage may be hidden. With time the pressure roller/s may lock up and not roll and the pivot pin may lock up tight. Both of these problems will affect bill acceptance. Generally the input bottom LED and the upper input cell take a beating and if there are not bad today tomorrow they will fail. You may not see the salt but if it is under them the salt will slowly eat away the wires till there is nothing left and you will have a failure.

The backside sensor and LED may also have gotten some salt on or under them. In fact, the small PC back may have also been hit.

While I am writing about the backside PC board and the LED and cell be aware the backside sensor reads the backside of the bill and in many acceptors, the signal is not there or is intermittent. Maybe there is a bad flux or just bad connections [mostly on the cell] so you have to unsolder the leads, clean them and then resolder them. The same is true for all LED and photocells. In the case of the OBA you have to check the input LED and cell even if they were not salted.

The old black flat front metal spring which puts pressure on center front

roller was replaced with lighter shiny spring. The lighter spring may bend out of shape when it is removed. Re-shape the spring before you re-install it. Make sure the flat spring does not short to the VI (input) photocell board copper and give you a V1 (VI input) error fault error. Other V1 (input) shorts can also occur at the top side spring clip used to hold the two wires in place or at the place where it goes over the side down and down to the connector, at the VI cell and under the cell assembly. A short can also occur under the PC board and the wire/s is shorted to the OBA inlet.

Bad bills with torn edges, faded, etc, will not be accepted, or what you think is a good bill is really NG. When you have trouble, always try other bills. Sometimes a bill will not be accepted. Holding the bill so light would shine through it showed the bill had a small crack in it and the light could pass through the hairline crack. Some control units have a blinking status LED will indicate acceptor problems. Counting the number of blinks is a diagnostic aid to indicate what the problem is. Count the blinks when the bill is returned and refer to the manual. Make sure when a bill is rejected, you leave right way where it is. Do not remove the bill until you have counted the blinks. If you take the bill out of the acceptor, you can affect the error code. At times, you may see one blink after another rather than a pause then an X number of blinks.

Normally, 1 1 1 1 1 1 1 1, etc would be read has a 1 code. Presuming you got a real V1 problem, you know, a real blinking 1 1 1 or the fault LED lit, then lets attack some real VI sensor or LED

problems. You cannot see visual light from the LED. It is not the same as a normal LED where you can see the light. Normally the 5 vdc from the control unit or logic board of the acceptor is fed to the LED, (mounted in front of the acceptor). A small current limiting resistor of 330 to 470 ohms is in series with the LED and the voltage across the LED drops to about 1.2 volts. The photocell "state", depending on the light falling on it, is on or off and is wired back to control unit/logic board of the acceptor.

Hairline cracks in a bill? Other V1 problems can be related to the scan of the bill. Besides starting the motor the scan goes to the end of the bill so other V1 problem could exist. One problem is a hairline crack or tears in the bill. If you put the bill up to the light you may find a crack or tear which is large enough to change the cell voltage it should (normally at the end of the bill) and you will get a rejected bill. You will get a V11 error but it is not a V1 error but a defective bill problem,

Use the Kodak lens cleaner on the photo cells and LEDs. Some glass cleaners can damage, or leave a film on the LEDs and cells that can reduce the light transfer as much as 40%

If you have a broken head assembly you can buy a complete assembly or by the bare head assembly and swap the sensor and magnetic head. Be warned that the mag head will have to be carefully aligned.

When it comes to Rowe magnetic head replacements most heads are

realigned in a magnetic head assembly. If you opt out to replace a head be advised head alignment is very critical and it will have to be aligned correctly. Start with optical alignment but fine-tuning may be required. A few degrees off will mean poor acceptance.

When replacing an OBA head clean the head pins before attempting to solder the pins. One of the copper lines goes from the head pin back to the wire terminal on the back. Make sure the line is still connected after you have finished soldering the pins. If the line is broken you can replace it with a piece of wire.

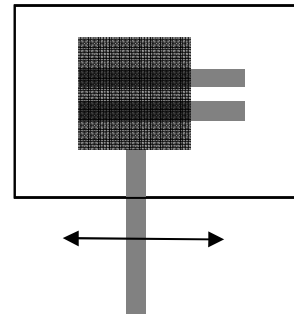
While I am writing about a broken connection one of the problems can be connections and cables. Here is another BEAR tip for you. First, understand the magnetic heads have a DC voltage applied to them. A current source is used to supply the voltage. When the head is connected to the source the DC head voltage will be in the region of 1.2 vdc [depends on the head]. When testing you can use the theory that DC voltage comes from the control board or the magnetic amplifier. The voltage without the head connected will always be greater than 1.2 vdc and it will be 5 vdc in the case of the OBA. So with the head connected if you measure the voltage the head it should be ~ + 1.2 vdc. If you read a higher voltage it might be an open head but I have never seen an open magnetic head. What I have seen is a lot of opens between where the voltage was read and the connection going to the magnetic head. The places where the open can be found are endless. On magnetic heads where it is soldered to a board, it might be the bad

solder connection at the head pin. You may find bad connections on an interface board and so on. If you start off with zero [0] vdc you may have to look for a short, an open, or the voltage is not coming from wherever the head voltage comes from. When I am working with mah head voltages, I like to find a spot where I can stick my meter leads to measure the voltage. I start with the acceptor connected to the changer. Then I work one way or another to find the problem if I do not see the 1.2 vdc.

The 93/94 history of the high replacement rate of magnetic heads also started me thinking about finding a way to extend the life of a magnetic head. I did find a way. Here is another **big Bear secret** you will want to remember. On a many bad head gaps it was not the opening of the gap which was normally found in professional audio tape systems but what was happening on the bill acceptor heads was a smearing of the gap and in consequence a closure and shorting of the gap. The gap was no longer a defined as a clear line. This caused a short of the magnetic field across the gap. I knew about the head lapping process for polishing heads but I had to find a simpler way to clean up the smearing which was closed the head gap. I had a Dremel tool in the shop so I started to use it to clean up the gap on heads. I used a Dremel 1/2" soft felt polishing wheel #414 with #421 polishing compound on it. I tried it out on some old bad magnetic heads at various speeds and methods. I found the key was to use a very slow speed and to run along with the head gap and not

across it. Look at the picture.

Dremel soft felt polishing wheel #414 with #421 polishing compound.



Don't over do it. I was very pleased to observe the **smearing** of the gap disappear leaving a defined gap line on many of the heads. Many customers do not know I have been using this polishing process since 1994. Scores of heads have been polished since 1994 and many customers' acceptors did not have to get a new magnetic head installed. Customers that saw me doing the process may have assumed I was just cleaning the head. At some point with uneven wear or when the gap as opened up, you will have to replace the head but sometimes polishing can extend the life of a magnetic head. I had stopped keeping detailed records at home but I can tell you the head replacement rate dropped since I started cleaning up the gap. There are various versions of magnetic heads so you may want to try this buffing process. If nothing else, it is a hell of a way to clean a magnetic head. You had better have some Radio Shack Magnetic head cleaner handy after you polish the head. You have to clean up the polishing compound.

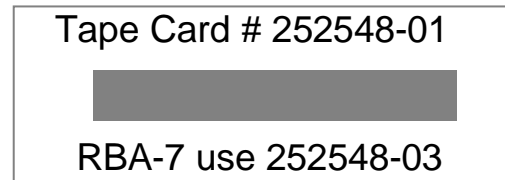
When I do the mag head test [read my

Mag heads notes] I do have my OBA test control unit opened up, I added a test point on the op amp, and I connect a scope to it. I can also use my loop test CBA-2 mag amplifier where I have added a connector so I can unplug the OBA head cable going to the interface and I can plug it into the test amplifier so I can make my mag head test.

The OBA has two types of pressure roller setups. Originally, Rowe used a solenoid and an associated pressure roller. Rowe found out the solenoid was not needed and the end users started unplugging the solenoid two wire plug. Many people cut the two wires to the solenoid because others would see the connector unplugged and they would plug it back in. Some people cut out the solenoid diode and removed the two-wire connector on the interface board. Rowe later designed a new pressure roller and bracket to hold its pivot pin in place. Rowe stopped putting the two-wire connector and diode on the interface board. If you have to replace the old style solenoid pressure roller, you can get a new pressure roller update kit.

Keeping the magnetic head pressure rollers in good shape and free of bill ink build up and contaminates is very important for good acceptance. To this end in 1995, Rowe designed a tape-cleaning card using paper and thin double sided tape to clean ink, dirt, and other contaminates off the magnetic head pressure rollers.

Read the instructions on the card]



The one sticky side is attached to the paper and when you are ready to use the card, you remove the protective paper to expose the sticky tape. I prefer to remove the acceptor and then stick the card into the acceptor.

The sticky tape side must go towards the pressure roller. I use the motor gear to manually run the card through the acceptor and have it come out the back end of the acceptor. While the cards were made for the BA50 acceptor, they can be used on Rowe acceptors (except the RBA-7 that has a special card). Some acceptors do not pull the paper into the acceptor so you will have to hand crank the acceptor.

I have attached a Bear note about making tape cleaning cards. While one is shown for the BA50 with two pressure rollers you can a hole in the middle for an OBA. You can make a strip from notebook soft plastic sheets and use the Scotch double-coated tape #665. You will not have to cut a hole in the strip. One the first pass you will have to hand crack it and push it through so the creasing rollers can shape/fold the strip.

How often you use a tape cleaning card will depend on how many bills go through the changer in a given time period. The site location and changer

use controls the period between cleaning. Once you start using the cards in a given changer, you can tell how bad the rollers get by looking at the card after you have used it. An example: A car wash has an outside bill changer and one inside the building. The outside bill changer gets three [3] times more use than the inside bill changer so the outside changer will need cleaning more often than the inside bill changer. Keep notes on when you do the cleaning and how bad the card looked afterwards. With this information you should be able to fix a period of time for doing the tape card cleaning for **each** bill changer.

Back to rebuilding the OBA.

Once the acceptor is rebuilt you have to adjust the lower belts and like I wrote in "A Motor Test Unit" you apply the 12 VDC from a 7812 voltage regulator power supply to the motor and you adjust the belt tension. You can wing it but this is the only way I know how to do the job right.

I also use the 12 vdc to make sure the motor to gear adjustment is **not too tight** which can be a serious problem or it may be just too loose. It is best to check the motor screws because I have found where the screws were loose and even missing. While the motor is running you can also hear if you have other acceptor problems like wow and flutter, clumps of debris in the shaft pulleys, cracked pulleys, etc. In fact when you work on an OBA look for damaged pulleys and debris which might have built up in the pulleys. You may also find the outer edge [ring] of the pulley is damaged or may be broken

away from the pulley. Make sure the free pulley roller on the input shaft is not frozen to the shaft.

Shields can be cable problem. Shield strands can short to other pins on a connector, short to another shield, or touch metal parts of the machine or stacker cause ground loops and weird problems.

A shorted cable or bad acceptor can reach back into the control unit and blow many ICs. One thing you can do is to open the unit and look for the 2003 IC on the top board. Serious damage shows up generally, but not always, on the 2003. It may be cooked or may even have a hole in it. This is a result generally a short of 30 vdc to the 5 vdc in the acceptor, cables, solenoid, diode, etc. If you get another unit and plug it into the system, poof goes the second board. Always take the cover off and look at the 2003 before replaced it with another unit. Never plug a bad unit into working machine. Look first! I had seen frayed shields, pinched cables, burnt cables and even screws and nuts across inside control units or in acceptors. A shorted wired in a cable can cause problems. Let's look at one example. The report was an OBA did not give credits on \$5 bills. To make a long story short the system did not reject bills. When I asked the vendor to test the system by putting a bill in backwards to see if the acceptor returned the bill the answer was NO! At this stage of the game, it could have been in the acceptor, control unit or the interface cable to the acceptor. Since the vendor had other work to be done on the game I got a chance to work on

the problem. I already knew the problem could be a short of one of the motor wires (RED or BLACK) to ground or the cable's shield. I did not see any frayed shielding causing a short at either end of the cable nor any other place where the short might be occurring. We changed the cable and the problem went away. A test of the bad cable showed that the black wire was shorted to the shield. It was intermittent as I moved the cable. It was shorted most of the time. I cut back the cable insulation where the testing indicated where the short might be. Under the shield, I found a nick in the black wire insulation that exposed the wire to the shield. I repaired the cable by cutting it back since I have three new pins and a crimping tool. Note that no credits or eating the bill problems was simply that there was not reverse action.

Clean the cable connectors. It's best to do cleaning first. It may save you a lot of time in the long run. Some people use a bill, others use erasers, and others use a contact cleaner or a combination of these items. Fiberglass brushes have also been used. What ever you use is up to you, but getting low contact resistance is the name of the game.

Many problems with OBA systems are bad or dirty connections in the OBA control unit. You may have to open the control unit up and check for bad connections and do a little contact cleaning. Of course you might have cable problems too.

Swapping OBA 575-0x control units of the wrong type can create problems and

damage. The 575-0x units are different. -02 and -05 are for jukeboxes. The -03 and -12 are for the BC-1 changer. The -06 is for 490 multi board snack machine only. The -08 is for single price machines that work with a coin mech. swapping the wrong units **will cause serious damage.**

There are many different types of 4-50575-xx units and we already covered not swapping a unit with a different type. The lower and upper boards inside are also different and they go together in pairs. Do not swap upper and lower boards unless you know what boards go together.

Common units are:

TYPE	USED For
-01	Some early games
-02	Early juke boxes
-03	Early BC1 bill changer
-04	Special 1 5 10 20
-05	Junk boxes, games
-06	Multi-board snack 490 Switches 1-4 off 6=mag/speed
-08	Soda machine + external relays \$1 single price
-12	Late BC1 bill changer

What happens when you think a unit is OK and it is BAD? The 490 Multi Board vending OBA control unit is a bit different than all other units and we have noted that a V2 (flipper or cell) problem does not show up as a fault LED ON all the time. When the test button is pushed down, the OBA motor runs in short bursts. Be aware that many other items also have this motors runs in short bursts. You might have a problem

with V2 (anticheat flipper cell). It might also be the anticheat flipper spring is not hooked correctly on the shaft and flipper. If not, you can reset the spring but be advised un-hooking spring often occurs because a bill was stuck. Normally the un-hooked spring means there are other problems with the OBA acceptor. These are normal lack of lube, bad, worn, or dirty belts, flipper spring too tight, flipper sticking, oil got into flipper and on the shaft, etc. It might be something else; OBA interface, coin mech interface, stacker, cable, etc. Swapping the acceptor, and/or other units might be required to find which unit is creating the problem. You may find there is more than just one problem. All too often, someone thinks they have used or have a good acceptor but testing by me has shown the acceptor was defective. The V2 case above was just such a case where the acceptor was rebuilt (not by me!) and V2 was defective, plus the machine had a bad coin mech interface too. The bad acceptor was put into the machine early in the game so all further trouble shooting got very messy to say the least.

Not all problems are OBA acceptor problems. Problems with the BC-1 could be the switch on the dispenser control unit setting for the amount of coin pay out. No one touched the pay out switch, but NO pay out or the wrong pay out occurs and we find the switch setting got changed. Many times they are all OFF. The bucket door opens and the motor does not run because the switch/es are set off!

A DC varying pulse DC voltage on the

motor controls its speed. Reversing the voltage + - will reverse the motor direction. The speed adjust resistor sets a reference which is compared to the Tach signal coming from the motor. Normally if the controller does not see the motor's tach signal, the motor will at very high speed. No tach signal could be a bad connection of either one or both of tach wires that bring the signal back to the controller. It could also be a bad tach signal within the motor or a controller with a problem like a shorted motor transistor or bad 2917 IC. Normally there is a 7.5 ohm 5 watt on the lower board of a 4-50575-xx control unit that takes a beating and it may be bad, cooked, or have a bad connection problem. While we are in this area of the lower board if the transistor on the metal heat sink is a TIP32A change it to a TIP115 and replace R104 680 ohms with a 1.5K ½ watt.

Many vendors have learned if they have a problem with a video game the first thing to do is to measure voltages like AC line voltage and other voltages like 5 vdc yet when it comes to bill changers, juke boxes and vending machines they forget all about the procedure of measuring voltages. Many OBA control units such as OBA-P or some OBA-2s use a voltage from a main power supply. While the manual or markings may not be clear about what this voltage should be but it must be greater than 8.5 vdc. Let's take an example. A jukebox OBA-P control unit or a OBA-2 in a CD100A must have at least 8.5 volts going into it. Many strange acceptor problems may occur but the rest of the jukebox may be operating normally so you end up playing around with the acceptor and/or

the control box when the problem is in fact the juke box power supply voltage is below 8.5 vdc. You should always measure the voltages and also note in many cases the 8.5 vdc voltage ages downward giving you acceptor and acceptance problems. In fact, some mods are being made to the juke power supply board to assure the voltage is right up where it belongs. Later on Rowe came out with a new switching power supply board. Do not waste time and money with acceptor and/or control units, measure the voltages first. Get the new board and update the juke power supply.

From my old OBA notes:

I do realize there are many different types of people so the this paragraph may not be relevant to the you, but it may.., Please note I just added this paragraph on Jan 26, 1995 because a vendor who got a full copy of these notes last week called me today. He had been in before and we worked on a few of his OBAs and he had rebuilt one OBA acceptor with my instruction. His phone call stated he just put belts on an OBA it did not work. I asked basic questions like. Did you replace the shafts, clean the rollers holes with cleaner and a wire brush, lubricate the shafts, etc. The answer was no, no, no. I asked if he read my notes, he said "Yes, ! How do I address the problem of a reader he or she decides he or she will not take the advice and use the insights presented in these notes? The answer is I have already addressed the question, I did provide the insights but there will be vendors when will follow his or her order of things no matter what the written word has to offer. I had not considered

a parent-child relationship as I wrote these notes even if it appears that I should. I presumed a high school background with a certain amount of common sense and an interest in getting things to work would be enough. I filtered in many vendor denials to encourage people to look at the information and figured it would help resolve conflicts with a vendor's order of things and my order of things. However, we end up with more the one point of view so what a remains is: "What is, is" and you get what you get! If that be the case, why call me and ask; "Why doesn't it work?" Do you think I am going to tell you more then what is already written in these pages? Sorry, there is nothing else to say! You can be assured if I learn, or see, anything new I will add the information to these notes but, as you should know by now, you cannot beat the odds by taking short cuts and I will always differ with your order of things that says you can take short cuts when re-belted an OBA. Right now I am writing in a parent - child mode; you cannot take short cuts and if you do, you will be punished. If you want to take a adversity position, don't call me and ask; "Why doesn't it work!"

> End of official parent-child mode paragraph Jan 26, 1995.

A word about the subject of motor noise and its effect on bill acceptance. As explained in other Bear notes you measure put 12 vdc on the motor leads and then measure the vdc then switch the meter to VAC scale and you will measure and record the ripple/noise voltage. Sometimes the failure of a system to accept a bill may be related to

excessive motor noise and some of Rowe's mag adjustment procedures in the manuals were written in which motor noise was a factor for the adjustment. I have never gone along with Rowe on making a mag adjustment without actually having to put a bill into the acceptor. Years ago I decided I had to find a better way to adjust the mag gain which actually used a bill. Along with this article, I have added my original short form type of Bear note on Speed and Mag adjustments that my customers have gotten for many years is at the end of this article. It covers my procedure for speed and mag adjustments in detail. The mag signal adjustment is like the volume control on an audio tape machine. We can say; If the volume is too low, we cannot hear it, hence no acceptance. On the high end, (depending on the tape machine), you may be able to hear it ok even if its very loud, but in other units, it may be too loud and so distorted you cannot run it wide open so we turn it down a bit. Max gain would be a case of more is not always better. We have to make the adjustment somewhere in the middle of the active acceptance range. Somewhere above where it starts accepting the bills and below the place where there is too much gain and therefore no acceptance. See Mag and speed adjust page attached to this article.

Let me end with this partial extract from one of my Sad Stories series of notes. This letter came from: "A Very Sad Story # 3": It was written many years ago. I got this letter from one of my acceptor friends Mr. Motor-gear O_ba.

*Hi Bruno,
(Otherwise know as The Bear !
<hehe>)*

I don't know if you remember me. Bruno, I'm Motor Gear Oba. I belong to Bob who owns 31 BC-1s. Life has been great since you made a motor to gear adjustment on me and showed my boss Bob how to do it. He rotates his 31 OBAs and strips us down every year, He uses a Magic Wand and replaces what needs replacing. It's been eight years since I last saw you but my boss does everything the way you do it maybe even better because he does me every year. I know he told you it's money in the bank because every buck gets accepted and put into his bill box.

I'm writing because I am in the shop for my yearly work over and the Bear picture on your Oba story caught my eye so I read the Sad Story. While I only met you once I want you to tell your hurting acceptor friends there are few people out here, like my boss, who care about us as much as you do. Life can be great for an acceptor. We get every bill and just love to shove the bill into the cash box. Up here we OBAs know as long as we keep putting every bill into the cash box we will have a long and wonderful life without aches and pains and those near death experiences you wrote about. The only real pain I have ever felt was that tight motor to gear thing and you fixed that. No OBA here has felt that pain since you showed Bob how to adjust it. We get new shafts, belts, or whatever all the time. Some of us have gotten very old so we get new mag

heads, and motors to. After all, we collect a lot of bills for Bob..With a boss like Bob I don't think I will ever see you again so that's why I wrote... Like Oba and Cba I hope you keep being The Bear! Maybe vendors and gamers will get the message some day! Bob got the bear message many years ago and all of us up here thank you.!

*Thanks again, your friend,
Motor-gear O_ba*

Sometimes my acceptor friends say it better than I can.

May the OBA be stacking those bills!

Bruno The Bear Puglia

Attached

Clean

Speed and mag adjust

OBA lube

Tape card

Cleaning Mag Head Pressure Rollers

Rowe has designed a card using paper and thin double sided tape to clean ink, dirt, and other contaminants off the magnetic head pressure rollers. The one sticky side is attached to the paper and when you are ready to use the card remove the protective paper to expose the sticky tape. Then stick the card into the acceptor. While the cards were made for the BA50 acceptor they can be used on all Rowe acceptors (except the RBA-7) and other acceptors. Some acceptors do not pull the paper into the acceptor so you will have to hand crack the acceptor. People who have seen me work know I always use tape to clean the roller/s under the magnetic head/s.



Rowe Part #
252548-01

Rowe now has a card
for the RBA-7.
Use
252548-03

Bruno

Clean51T.pgs Mar 05, 2005 1T



To join the MAGIC WAND CLUB buy one of NECo's Trinity Oilers or a similar type.

Your dues are:

- 1 Buy an oiler, Trinity, Radio Shack's Lubricator # 64-2301A or Rowe's silicone lubricant 270628-01
- 2 Use it for preventive maintenance.

- Warning -
3 Over lubrication and/or getting oil on the belts voids your membership. More is not always better !

When the oiler is empty you will be a full member in the :

**The
MAGIC
Wand
CLUB !**
Bruno



The Bear does use them !



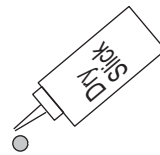
Rubber and belt cleaning should be done when cleaning and lubricating the acceptor. It should be at least once a year and more often in a dirty location. Do not over use the rubber cleaner ! Apply evenly with a soft cloth until clean. Wipe off all excess including the edges. Re-Grip is a cleaner and revitalizer.

Re-Grip
Rubber
Cleaner

Cleaning Rowe Hoppers and Dry Slick !

What can you use to clean and lubricate Rowe Hoppers and clean coin mechs ? Brushing alone is not good enough. Make a wooden or plastic chisel to clean off the hard dirt on either side of the chain. You can grind or file the end of the hopper brush to make a chisel. The product called Dry/Slick is a very good cleaner when wet and when it dries it leaves a surface film which does not collect dirt. It also lubricates the hopper chain. I do not recommend Dry/Slick use where a build up will cause a serious tightening (such as tight shaft and nylon bearing). There is no problem when used on a Rowe hopper or on the coin mech area where the coin slides.

If you can't get hoppers to work right remember "Bruno" can refurbisher your hopper and fix the rivet problem too. . Generally the cost per hopper is \$80-\$100 if it has normal wear and tear.



More good stuff !



Using those Cleaning Cards on Rowe Acceptors ?

Rowe original recommended using **denatured alcohol** (paint or hardware store) to clean Rowe bill acceptors so how can you use these cleaning cards? First, let the cards dry and then apply denatured alcohol on the paper to clean the acceptor. After cleaning with a wet card **ALWAYS run a dry card into the acceptor.**

Over kill should be avoided so **do not** use the cards every week, or month, but just when the belts start to get dirty. You can judge time between card use after the first time use by inspecting the amount of dirt picked up on the card.

SPEED ADJUST ON OBA 4-50575-xx UNITS

Speed adjust is a must ! There is only a 3 % acceptance range. The speed must be adjusted BEFORE using my mag adjust procedure, With a good lubricated acceptor, good control unit with good cable and clean connectors start with the FAULT indicator OFF. Turn switch #6 ON as marked on the cover and press the TEST switch. Slowly adjust the speed until the FAULT indicator stays OFF. If you can not keep it off, keep it off as much as possible. Blinking on and off may mean you need another acceptor or you have a problem in the system. You can leave #6 on if you are going to use the [Bruno] Mag adjust system

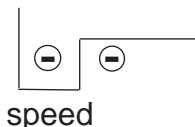
Where they exist, Speed and/or Mag adjustments is a must. Many acceptors do not have a speed and/or mag adjustment.

SPEED ADJUSTMENTS OTHER THAN 4-50575-xx Units

Before doing a Mag adjust, you must make the speed adjustment first. No amount of speed and/or Mag adjusting will fix an acceptor which has stickation problem and it needs lubrication. After you adjust the speed, it may accept bills for a short period but if the acceptor has stickation, and you take no action, you will be back.

Most control units use a status or fault indicator for adjusting the speed. Press the TEST button or the reset button. Adjust the speed until the status (or fault) indicator stays on all the time. If it blinks perhaps there is an acceptor or a control unit problem.

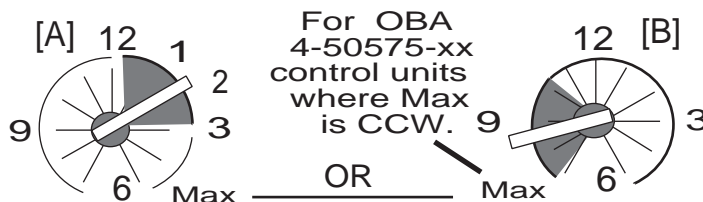
Older CBA/UCBA-2s have a speed adjustment pot. New upside down modules do not. Make sure you adjust the "speed " pot and not one of the other pots.



Spd_mag1M March 03, 2003 1M

Adjusting Rowe Mag Gains

There are many reasons to adjust the mag gain as listed below. If a speed adjust exists, adjust the speed FIRST. With an average bill, start at one end and insert the bill. Move one clock position and reinsert the bill and repeat the process until it is accepted. Note this position, say 12 noon. Go to the other end of the pot and repeat the process again going back one clock position till the bill is accepted. Say 3 pm. Set the mag gain between the 2 accept points (shaded area) at 1:30 or 2. See [A]. With OBA 4-50575-xx [B] units Max is CCW. You may find the range is between 7:30 and 10 so you would set the gain at 9 or 8:30. If it does not work when tested, repeat the process with another bill. In checking, you may find you get some rejections and the adjustment wants to be closer to the Max position or Min position. If the unit gives an error code when the bill is rejected. Use them and the manual as an aid. With the new \$5 conversion follow the procedure given in the installation note. Then you may have to try this system.



Bruno's "STICKATION"

STICKATION describes is a condition which occurs when an acceptor can not come up acceptance speed. Generally this occurs because the acceptor needs lubrication. If it has been at rest for a while, it can not make speed. With repeated inserts of the bill or adjusting the speed, the acceptor works but after a period of idle time, it slows down AGAIN.. Preventive lubrication is required and this will also cut down on wear and tear which leads to expensive repairs and exchanges costs. This is what Magic Wandings s all about.

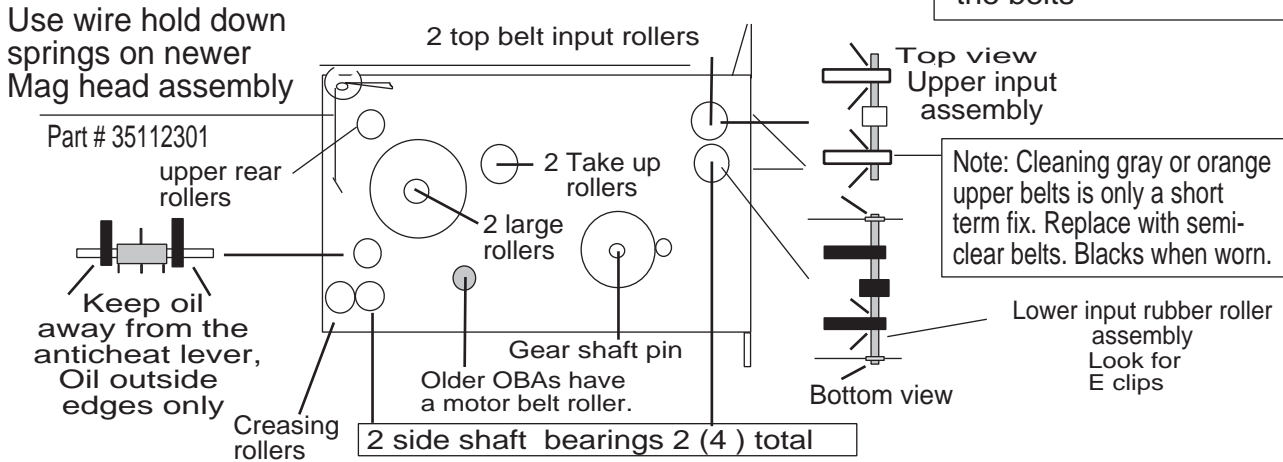
The Magic Wand Club !



Every \$30,000 or once a year which ever comes first !

OBA Acceptor lubrication, cleaning & rebuilding

Warning: Do not over lubricate or get oil on the belts



The Rowe OBA manual does not give a preventive maintenance schedule for lubrication. If you wait till acceptor slows down, the damage to all parts has already occurred. Lubrication should be done at least once a year or more often when the OBA gets high usage. Save yourself expensive repair costs and keep the bill box filled !

Clean the photo cells and LEDs with Kodax lens cleaner, belts with rubber drive cleaner or denatured alcohol (Paint supply store), and the mag head pressure roller with scotch tape. Do not remove the mag head from the head assembly because it is normally factory aligned with a special alignment fixtur.

If you use those pre-soaked cleaning cards, let them dry first, then put denatured alcohol (paint store) on them. ALWAYS finish by running a dry card into the acceptor. Never leave the Mag head pressure roller wet. Clean only when dirty.

Replacing worn belts may require replacing worn shafts, cleaning rollers (use gun wire brush) and lubrication. If you take short cut the acceptor may not operate correctly. OBAs may have a lot of wear so the mag head and pressure roller may need replacement. Always use the newer extended tab anticheat and lighter (blue) spring. Do not use those hi-low sheet metal screws in the head holder. Use the hold down springs.

OBA_Lube Jan 6,2002 1 T



To join the MAGIC WAND CLUB buy one of NECo's Trinity Oilers or a similar type.

Your dues are:

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2 Use it for preventive maintenance.

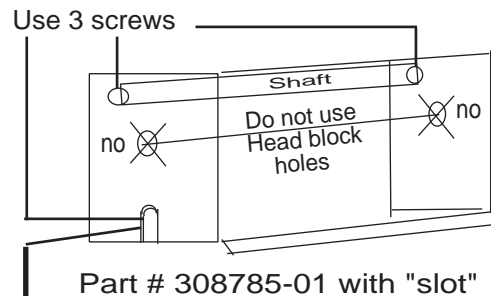
- Warning -
3 Over lubrication and/or getting oil on the belts voids your membership. More is not always better !

When the oiler is empty you will be a full member in the :



4900 Single board ,OBA Bracket

With an OBA with a new Head assembly (no metal inserts for screws) use the Hold-Down wire springs [part # 35112301 and use the newer OBA 4900 bracket. use only three (3) screws. If you have the older bracket which does not have the slot-hole drill a new hole in the older bracket.



No slot, then drill a new hole in the bracket !

A BA50 MAGIC WAND

Template for a plastic tape cleaner to clean metal particles, ink and other contaminants off the BA-50 Mag head pressure rollers without taking the acceptor apart. You may have to take the acceptor apart if this does not work or you may have to replace the rollers. Serious particle problems may be addressed by replacing the rollers with 2 nylon rollers. The Rowe roller part number is 3 50806-05

13 "

TOP

TOP VIEW

SIDE VIEW

Rowe's Version

June 26, 1995 Rowe has designed a new type of card using paper and thin double sided tape. The sticky side is attached to the paper and when you are ready to use the card simple remove the protective paper and expose the sticky tape. In case you want to buy Rowe's cards the part # is: 252548-01.

It can be used with other acceptors but if the motor does not pull it in far enough you can turn off the power and hand crank the motor.

Double tape

Put scotch tape over the openings.

Soft plastic .008 - .012 thick



Bruno

Except for this cut and the side view, the rest is shown to scale.

It must be SOFT enough to pass through the creasing rollers in the back of the BA-50 acceptor. For those who have the "Hands On" school booklets, you can use the plastic covers. Those covers are comb plastic booklet covers which are .011 - .012 thick. IBICO comb presentation cover IBICLEAR # 23210 Heavy.

Use the motor gear to hand crank the strip down the bill path. Handfeed the plastic past the creasing rollers.

You can also use Scotch double coated (double sided adhesive on both sides) tape #665 on a plastic strip. I used sheet material used for notebooks.

Double tape

There is no need to cut holes in the strip with this tape..

March 06, 2005 , 2005 Bx50clean1G.pgs

At some point in time you may want to check out my other Bear notebook articles because they contain a great deal of related material. You will find them on Bruno's Page in <http://www.eastcoastamusements.com/> then: left click on: **Visit his page for service notes and tips.** **OR:** <http://www.eastcoastamusements.com/services.htm> and then click on the BEAR with the flower!!

Note: These files were checked with Acrobat Reader 7.0. Earlier versions **may not** view/print correctly. I know version 5.0 will not work correctly.

If you click on that tile name and if your computer is loaded with the Adobe reader the file this will open up an Adobe window. If you want to save the Bear Notes .pdf file/s from the Bruno page you can right click on the article title and a window will appear on the screen. One of the selections will be Save Target As. Left click on it and a Save As box will appear and you can select where you want to save the .pdf file. You can save the file on your own computer.

You will want to check the East Coast Amusements site for revised or new articles. I do have more titles in the works. Here are some the posted articles.

ROWE 4900 ACCEPTOR ISSUES
ROWE BC-1 BILL CHANGER
THE MAGIC WAND (Dick's - my favorite)!
CONNECTORS - FIXING AND TESTING (another good one)
ROWE BILL CHANGER HOPPER REPAIR
MEASURING VOLTAGES
BUCKET POWER ON ERRORS
ROWE STACKERS
MAG HEAD LOOP SECRETS
DREMEL & ROWE STUFF
FEK MOTOR TEST UNIT
OBA ACCEPTORS
JACKPOTTING, FS, BUCKET POWER ON & CRASHES
BC-8 to BC-35 Bill Changers
CBA_UCBA
Basics_101
BCxx00_bill_changers

If you have trouble printing some Acrobat drawing pdf pages:
Adobe Acrobat printing of some drawn picture pages correctly may require using Acrobat printer setup and setting Print to image on.

Please take note that East Coast Amusements is supplying the Bear Note pages on their web site for you and for me at their expense. I just write and East Coast Amusements does all the rest.

To East Coast Amusements
> THANKS ! Bruno

1F