

## Bell Disc

**Model:** RC-47

**Chassis:**

**Year:** Pre 1952

**Power:**

**Circuit:**

**IF:**

**Tubes:**

**Bands:**

### Resources

[Riders Volume 22 - BELL 22-DISC REC 1](#)

[Riders Volume 22 - BELL 22-DISC REC 2](#)

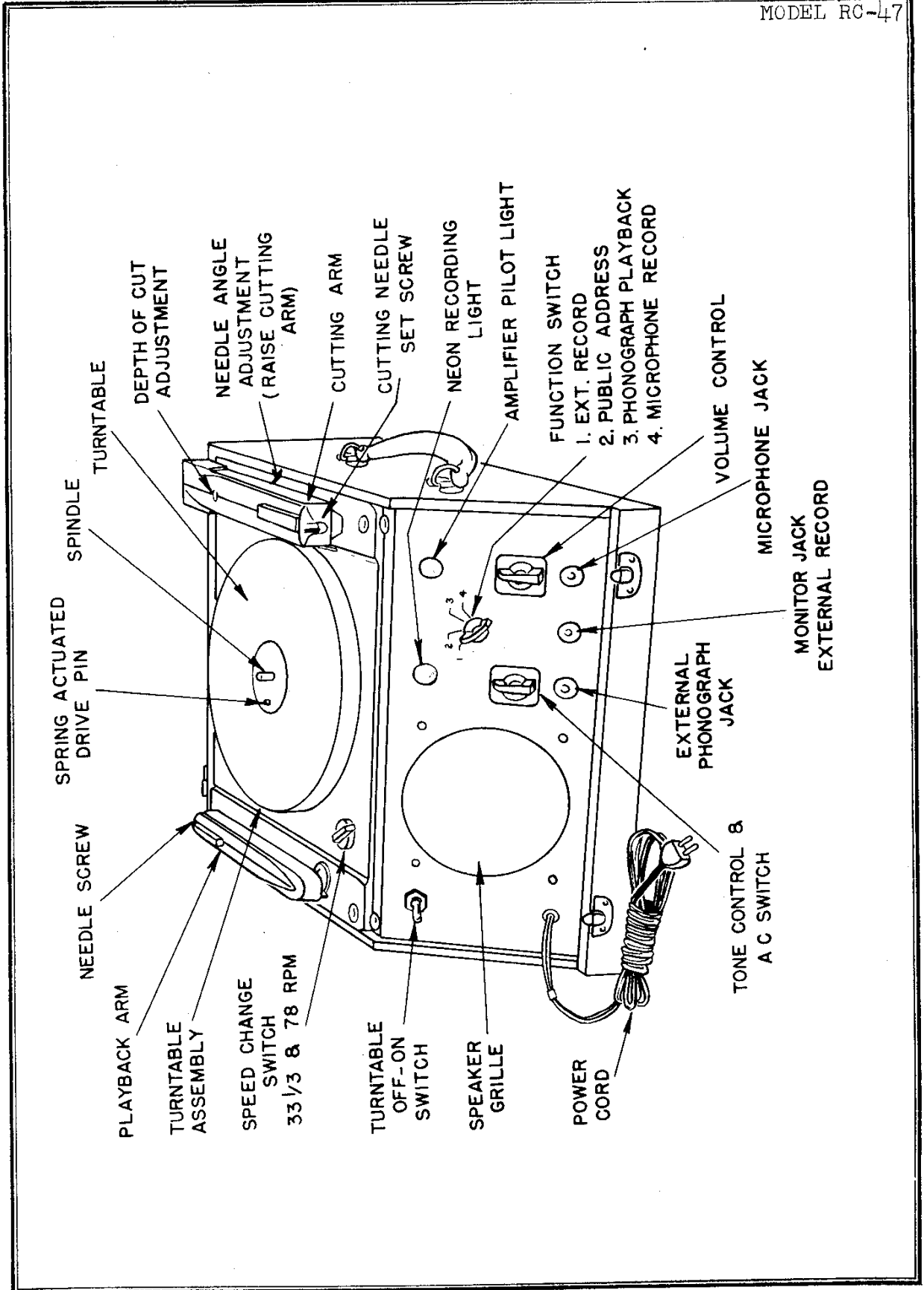
[Riders Volume 22 - BELL 22-DISC REC 3](#)

[Riders Volume 22 - BELL 22-DISC REC 4](#)

[Riders Volume 22 - BELL 22-DISC REC 5](#)

[Riders Volume 22 - BELL 22-DISC REC 6](#)

[Riders Volume 22 - BELL 22-DISC REC 7](#)



MODEL RC-47

General Description - (See Outline Illustration)

The Model RC-47 Bell Re-Cord-O-Fone is a compact, completely portable three-tube disc recorder and playback unit capable of many uses. Complete with crystal microphone and stand; it is ready to record any sound and provide immediate playback. The slanting panel allows easy access to all controls. Phone jacks permit quick and easy connection of additional devices. Adequate tone and volume control provide exceptional, natural reproduction in any recording situation.

Receiving Inspection

Immediately upon receiving your Re-Cord-O-Fone, please check to see that no damage has occurred in shipment. Mount turntable on spindle with idler pulley properly seated. For carrying, place microphone base on post over spindle to prevent turntable coming off.

Connect AC plug to source of power (115V 60 cycles). Turn on phono switch. Turntable should run smoothly on both speeds as selected by rotating green plastic knob on motor board. Microphone should be plugged in and various functions checked. Check cutter by touching needle with fingertip.

If unit fails to operate, remove top and bottom screws holding front panel and chassis. Lift up and outward. See that tubes are plugged in securely. Be sure turntable cable is plugged in tightly to rear of chassis. Reassemble.

SETTING UP RECORDER

Place recorder on solid level surface. An accidental jar during recording might cause the cutting arm to shift, thereby spoiling an otherwise good recording. Set microphone at level of speaker's face, at least 15" away. Do not attempt to make recordings in large hard-walled rooms. Good results will be had in average living room. For best results rehearse material to be recorded so that proper settings and procedure may be ascertained.

**NOTE:** Be sure to read "Operating Instructions and Auxiliary Information" sections before using this Recorder.

OPERATING INSTRUCTIONSRecording with Microphone

Turn amplifier on by rotating "tone control" knob clockwise. Set volume control knob at zero. Insert mike plug in "microphone" jack. Set function switch at "microphone re-cord" and place mike in position for pickup. While subject is test performing, adjust "volume control" while watching neon light. Place recording blank on turntable being sure spring-actuated pin fits in one of the off-center holes in blank. Install new cutting needle. Be sure needle screw bears against flat side of needle. Turn on "turntable" switch and select proper speed, 33 1/3 or 78 r.p.m. Lower cutting arm on record and make test cut. Thread should throw toward center of record where rubber finger will cause it to wrap around spindle out of the way. Record may be played back at once.

**NOTE:** Care must be exercised at all times that this thread never gets under the turntable where it can be caught in the mechanism. This will cause irregular operation or complete stoppage.

External Record - (From Radio or External Amplifier)

Note: - Three methods are possible. Use one most suitable.

METHOD I

To record from an external amplifier or radio, proceed as follows: Secure a two-wire cable to the voice coil of the radio (3-6 ohms impedance) or to low impedance output of amplifier. Connect a phone plug to free end, being sure grounded side of radio is connected through wire to sleeve or plug. Recorder amplifier is not used for this purpose but may be left turned on if desired. Insert plug in "external Re-Cord" jack and set function switch to "external re-cord". Adjust volume and tone controls of radio or amplifier for satisfactory results. Best results will usually be obtained with tone control on radio turned up for maximum "high" response. Re-cord as above.

NOTE:- Radio or amplifier must be capable of supplying 5 to 6 watts undistorted, in order to produce good recording. At this power level, considerable sound is produced by the loudspeaker.

METHOD II  
(Preferred)

Connect as in Method I except insert plug in "external phonograph". Set function switch to "external re-cord" with recorder volume off. Adjust radio (or amplifier) volume to slightly above normal listening level and tone control for good treble response. Advance recorder volume control to proper level. Readjust controls if necessary. NOTE:- It may be necessary to reverse one or both AC plugs to secure lowest hum level.

METHOD III

Set up as for "mike record". Place mike 15" to 24" in front of, and to one side of speaker. Re-cord as usual. This method is the simplest to use but care must be used to prevent pickup of room noises.

External Re-cord from external Phone unit

Any record may be copied or re-corded on another blank. Proceed as follows: Insert plug from phono unit in "external phonograph" jack. Set function switch to "external record". Place record to be copied on other turntable and blank on recorder. Place external playback arm on record and adjust volume control on recorder. Start recorder turntable and re-cord as usual.

DUBBING

If desired, vocal comments may be added to (dubbed in) recordings by setting function switch to "mike re-cord" and speaking comments into the microphone. This procedure should be monitored by headphones in order to get good balance. Neither should be much louder than the other if good results are to be obtained. The external phone unit must have a separate volume control for this purpose. Adjust the microphone volume control first, then set the external volume control of phone or radio for proper.

PLAYBACK

Always use new needles on instantaneous recordings to prolong their useful life. Turn "turntable" switch on. Be sure turntable speed is correct for record being played. Turn function switch to "phonograph" position. Lower playback arm to record surface--do not drop. Adjust volume and tone for most pleasing results. Mike cable may be left plugged in. Any record up to 12" may be played back. (See Auxiliary Speaker paragraph)

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Public Address Usage

To use as a Public Address System, turn on amplifier by rotating "tone control" knob clockwise. Set function switch at "Public Address" position. Insert mike plug into "microphone" jack. Extend mike cable to full length or use extension cable to allow turning up volume control. In some applications it may be desirable to use external speaker and locate it at one side for better results. Adjust volume and tone controls for proper level. (See speaker on auxiliary speaker)

The speaker will howl if volume control is turned up to high and the microphone is too close to speaker. Separation of the two or turning down volume control is only cure.

External Phonograph

To use an external phono unit such as Bell Sound Models 10T, 10R or "C" with this recorder, proceed as follows: Terminate the shielded cable from the phono unit with a phone plug and insert into the "external" phonograph jack. Turn function switch to "phonograph" position. Adjust volume and tone controls for best results. (See paragraph on auxiliary speaker.)

AUXILIARY INFORMATION

Adjustment of Cutting Arm

There are two adjustments of the cutting arm; one to vary the needle pressure, and another to adjust the needle angle. These are necessary because needle length and blank material and thickness vary. They are interlocking to a slight extent and it may be necessary to recheck one after varying the other. Do not attempt to change these adjustments until the following is thoroughly understood.

Refer to the outline drawing. The needle pressure adjustment is made by turning the screw in the top of the cutting arm. Turning clockwise increases needle pressure and vice versa. The needle pressure should be such that a thread approximately the size of human hair is produced. It should be straight, not curly or fuzzy. The latter condition may also denote a damaged cutting needle.

The other adjustment is found when the cutting arm is raised to a vertical position. The bolt with locknut may be turned so that the end of the cutting arm is raised or lowered. This varies the angle which the needle makes with the vertical to the blank. The cutting surface of the needle should be at a 90° angle to the blank. This may be checked by setting the cutting needle on an uncut blank and raising or lowering the arm until the face of the needle and its reflection form a straight line.

If the needle pressure is too much or the angle wrong, the needle may be forced through the coating with damage to tip. It may also slow down the turntable and cause "wows". If the pressure is too little, the groove will be too shallow to hold the playback arm, causing it to slide across the record.

Recording Level

It is quite important that the recording level be carefully adjusted, otherwise results will be discouraging. Three factors govern the strength of the signal delivered to the recording head:

(1) Setting of volume control; (2) loudness of sound; and (3) distance from microphone. If the voltage to the cutting crystal is too great the crystal

may be damaged and the record groove walls broken down. If this voltage is too small the playback will be weak and noisy. Also, needle scratch and motor rumble may interfere with the recorded sounds.

To help the operator correctly adjust this voltage a neon light is provided. This begins to flash when the volume control is set right. Proper adjustment is made when the lamp flashed on the louder parts and goes out on the softer. Too much volume will light the bulb continuously and even cause it to have a bluish glow.

NOTE:- Riding the level or continuously adjusting the volume during the recording is not recommended. Adjustment should be made so that the loudest passage will be recorded satisfactorily.

An AC voltmeter may be plugged into the monitor jack and the average volume set at approximately 1.5 volts. Loudest sounds should not cause the meter to read more than 2.0 volts.

Crystal headphones may be plugged into this monitor jack and the quality and balance of the recording judged.

### Needles

Sapphire cutting needles should be used for best results. Stellite and steel needles may be used with poorer results and shorter useful life. Sapphire, precious metal tipped or steel needles may be used for playback. Personal preference should be guide in selection. Useful life will usually be in proportion to cost. Never use worn or damaged playback needles on instantaneous recordings. Never use thorn, cacti, or fibre needles on acetate recordings.

### Cutting Blanks

Best results are had with metal or glass base blanks. Paper base blanks are adequate for test purposes or where not much importance is given the finished product. They are also cheaper while learning. As the operator becomes expert he will find that the more expensive blanks are necessary for best results.

On good blanks, the coating is thick enough that a deep cut will not allow the needle to catch in the base or be dulled or broken. Bubbles, surface irregularities or warping are enough to reject any record.

It may be necessary to adjust both depth of cut and angle on blanks of different manufacturers, even when using the better makes of recording discs. (See section on adjustment of cutting arm.)

### Auxiliary Speaker

If desired, an external speaker in suitable housing may be connected in place of the built-in speaker. Terminate cable with phone plug and insert in monitor jack. Better volume and tone as well as a more advantageous speaker location will result. It should have an impedance of 3.4 ohms to properly match output of amplifier.

Speed - 78 or 33 1/3 R.P.M.

Best results will be had when recording music at 78 r.p.m. However, where material to be recorded is long or where highest fidelity is not necessary, the lower speed will allow more recording on a given blank. Recording should not be started too near the outer edge because of irregularity of coating; nor, carried too close to label because of loss of tone quality.

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Consult table below for specific data.

<u>Blank Size</u>	<u>Speed (r.p.m.)</u>	<u>Outer Margin</u>	<u>Recording Time</u>	<u>Width</u>
10"	78	1/4"	4 1/2 Min.	3
10"	33	1/4"	11 "	3
12"	78	5/8"	5 1/2 "	3 1/2
12"	33	5/8"	12 1/2 "	3 1/2

#### Routine Care

While these units are quite sturdy, they should not be subjected to unnecessary rough treatment. Playback and cutting arms should be handled carefully. Neither should be dropped on turntable, nor should the needles be struck against any part. Such treatment may damage either the needle or cartridge or both.

Periodically, the turntable should be raised and any dust and cutting threads removed. Oil motor and idler pulleys with a few drops of light oil, being extremely careful not to apply oil on rubber pulley tire. Microphone cords should be checked for loose connections. Tubes should be checked and doubtful ones replaced.

Playback and cutting crystals and the microphone are sensitive to heat and should never be subjected to temperatures greater than 120° F. Continued exposure to direct sunlight should be avoided.

#### Repair - General

- 1 - Inspect visually.
- 2 - Check tubes - replace bad or doubtful ones.
- 3 - Mike voltage and continuity tests with aid of schematic.
- 4 - Check all electrolytic condensers on reliable bridge. Check coupling condensers, especially to output tube grid. Replace those bad or doubtful.

#### Phono Unit

- 5 - If phono is suspected, check motor speed using stroboscope disc under neon or fluorescent lights. Speeds should be 78 or 33 1/3 r.p.m. and steady. Motor should run quietly. Remove dirt or threads and oil.
- 6 - To check for defective playback cartridge; While playing record, place finger near end of pickup, press lightly downward and across grooves. If crystal is O.K., volume will change only slightly; if broken, volume will change considerably. If no volume, check input to amplifier. Hum will be heard if finger is touched to ungrounded amplifier lead after disconnecting cartridge. Replace cartridge.
- 7 - To check cutting crystal; If neon light indicates voltage present, cutting needle in the chuck will be felt vibrating. If voltage from amplifier is not available, the leads may be connected to the 115 volt AC supply where again the needle will vibrate. For quality tests, substitute a new cartridge and compare.

