

Jackson-Bell Goes Super

The First Superheterodynes

by Richard Gray & Jim Ryan

Many collectors forget that depression-era radio manufacturers were businesses. The ability to meet and even anticipate market demands was a key to survival as it continues to be today.

At the beginning of 1931, Jackson-Bell had the wildly successful model 62, which sold for \$59.50 with many packaging variations.

By March 1931, Jackson-Bell tried to move up and down the market by offering variations on the model 62 TRF design.

The model 50 at \$49.50, with one less tube and satisfactory local performance, was their down-market (less expensive) move. The model 68 at \$69.99 in a larger cabinet with push-pull audio output, was aimed at the high end of the market.

However, the price points of these new models were not competitive with other manufacturer's new offerings. Also, Superheterodyne was the new buzzword in the high-end market.

Flint Joins Jackson-Bell:

With the acquisition of the Flint Radio Company, Jackson-Bell acquired new technology that allowed

them to stay at the forefront of Los Angeles radio manufacturing. The model 62 remained the mid-range offering for a while longer, while the model 84 Peter Pan radio filled the role of the lower range offering at \$29.95.

By April, Jackson-Bell introduced the model 88 superheterodyne set based on a chassis using Flint components, circuitry, and metal chassis design. The cathedral version was available for \$59.50. The model 88 was an instant success.

The performance claims are impressive, and this radio does perform well. The semi-automatic volume control was aspirational. As implemented, it is more of a loud station mute.

The author (Richard Gray) has slightly modified the circuitry to get real AVC action, which works great! I assume that Jackson-Bell was unwilling to pay the Hazeltine licensing fees.



Jackson-Bell Model 88, Version 1
Outer Rim Drive Tuning with Standard Escutcheon
Earliest Model



Rear View of Model 88, Version 1
Used rectangular I.F. cans and very similar
chassis metal to that used by Flint

Jackson-Bell Model 88 Versions and Marketing

ILLUSTRATED DAILY NEWS NINE

Biggest Value in Radio

Jackson Bell

SUPER-HETERODYNE

8 TUBES

equipped with both...

PENTODE AND **VARIABLE-MU TUBES**

\$59.50

Complete

The San Francisco Examiner Advertisement
San Francisco California, 18 May 1931 - Page 18

SEPTEMBER 23RD, 1931. THE WIRELESS WORLD ADVERTISEMENTS. xiii.

Making Radio History!

AN 8-VALVE ALL-MAINS SUPER-HETERODYNE for only 19 guineas!

WITH built-in moving coil speaker and full guarantee!

H.P. TERMS £4 DOWN and 30/- monthly.

JACKSON BELL RADIO

These two Jackson-Bell Models are unbeatable in their respective fields—we say it because we know it to be true. Where else can you hear such superb reproduction? Where else can you feel the joy of handling such thoroughbreds? Selectivity is such that at only a stone's throw from a regional station, last year, a London station will only be received—with strength and clarity hitherto only associated with the "Locals."

Price, too, where else can you get a set embodying all the virtues of Peter Pan, all Mains, 4-Valves and Moving Coil Speaker for only 11 guineas?

We are not at the Radio Exhibition—that is—not inside, but we have a Showroom over the way, where WE CAN DEMONSTRATE. You don't have to take anything on trust, come in and hear it.

Jackson-Bell Distributors Ltd.
68, VICTORIA STREET, S.W.1.
Works: KENSINGTON.

DEMONSTRATIONS DURING SHOW WEEK AT
89a, HAMMERSMITH RD., Opp. OLYMPIA.

229 Advertisements for "The Wireless World" are only accepted from firms we believe to be thoroughly reliable.

The Wireless World - London, England
23 Sept., 1931, Advertisements xiii

Beware, the ad below is incorrect.

The Cabinet shown in the advertisement below is a model 87 (7 tube) set. The description is for a model 88 (8 tube) radio. Model 88 has a larger chassis, and the outer rim dial drive has the center knob slightly higher than the other two. The radio shown has all of the knobs in a row which is characteristic of the outer rim dial drive model 87 chassis.

The authors have found many discrepancies in printed material. The layout artist seems to have just taken the photo they had and matched that to sales copy with little regard for accuracy.

Get Ready for Fall Programs with a

Jackson Bell Radio

8-Tube SUPER-HETERODYNE

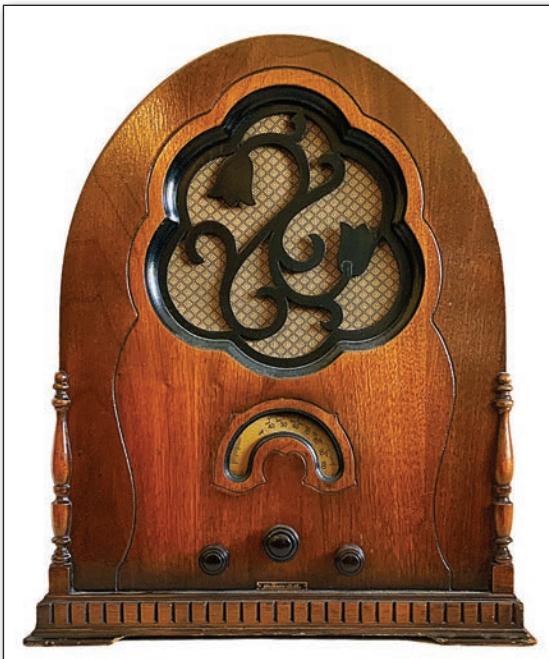
\$59.50

Complete With Tubes

The Dunn County News - Menomonie, Wis.
29 Oct 1931, Page 15

Other Offered Versions:

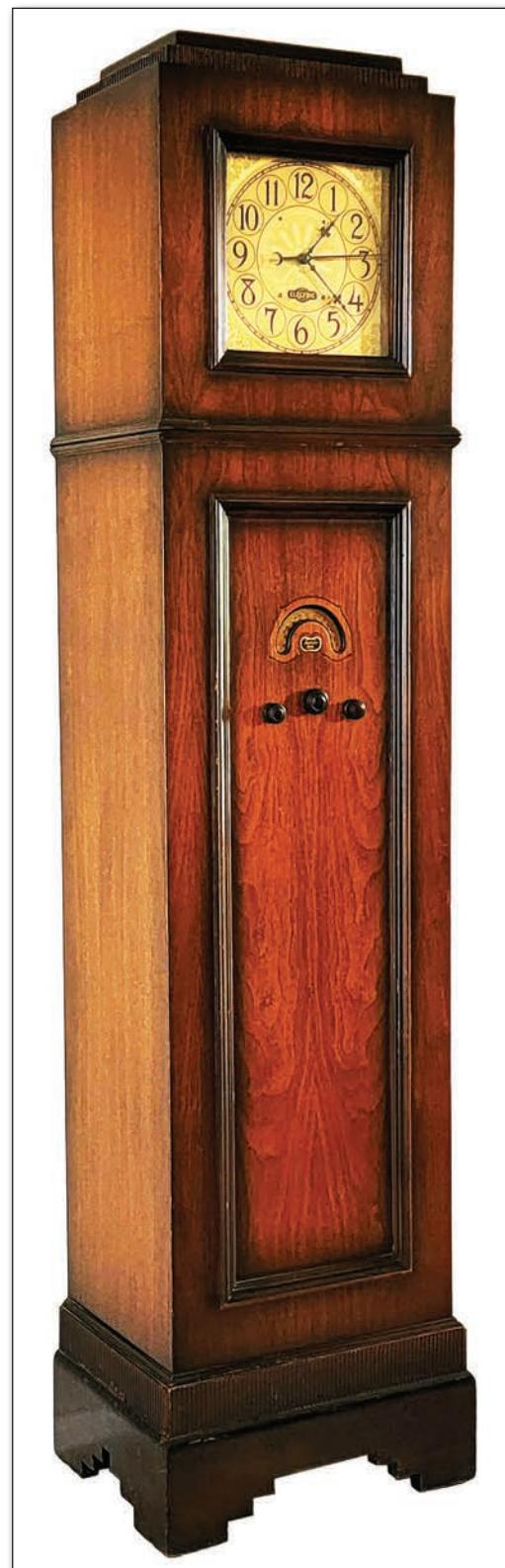
The model 88 came in several cabinet types and styles, including table top versions, consoles, and a large grandfather clock radio (shown below). These sets are very popular with collectors today.



Model 88 Full Vision Dial Version



Model 88 Console



Model 88 Grandfather Clock Radio

Refer to the block diagram for the model 88 on page 25 to follow this description.

The chassis features two R.F. tuned circuits to give good image rejection and an R.F. amplifier to give weak signal sensitivity. It includes an intermediate audio amplifier for improved volume on weaker stations. This radio also has a unique feature that reduces the audio output on strong stations if the gain is set too high.

Jackson-Bell Model 87

With the model 88 being very popular, Jackson-Bell offered a somewhat cheaper model, the 87. This seven-tube series offered very good performance, with similar styling options. The first version has an outer rim dial drive mechanism. A few months later the set was offered with an inner drive dial mechanism. The chassis was otherwise unchanged.

This model is a direct follow-on to the Flint design and uses the rectangular I.F. cans and similar circuitry to the Model 88.



Model 87 Outer Rim Drive Version

The Knob turns in the opposite direction as the dial.



Model 87 Inner Rim Drive Version

*The Knob turns in the same direction as the dial.
From the Collection of Richard Gray*



Model 87 Chassis

Rectangular I.F. cans, same as Flint

Refer to the block diagram for the model 87 on page 25 to follow this description.

The chassis features two R.F. tuned circuits to give good image rejection and an R.F. amplifier to give weak signal sensitivity. There is no intermediate audio amplifier. The volume on weaker stations is modest.

A sales brochure for this model follows on the next page.



Jackson-Bell Model 87 Four Fold Brochure

The Jackson-Bell model 87 chassis was housed in two cabinet motifs as was the model 88 chassis.

Jackson-Bell Model 89

Shortly after the introduction of the Flint-based Model 88 Superheterodyne model, Jackson-Bell introduced the 9-Tube Model 89. This top-of-the-line performance set has push-pull 47s in the output for increased volume. The R.F. amplifier is preceded by four stages of tuned circuits for extra adjacent strong station overload protection and excellent

image rejection. Unlike the model 88, model 89 uses a different chassis, with different style I.F. cans.

This early version of the model 89 has the escutcheon branding, and dial mechanism like the early version of the model 88.

Model 89 block diagram is on page 25.



Model 89 Front View
May, 1931



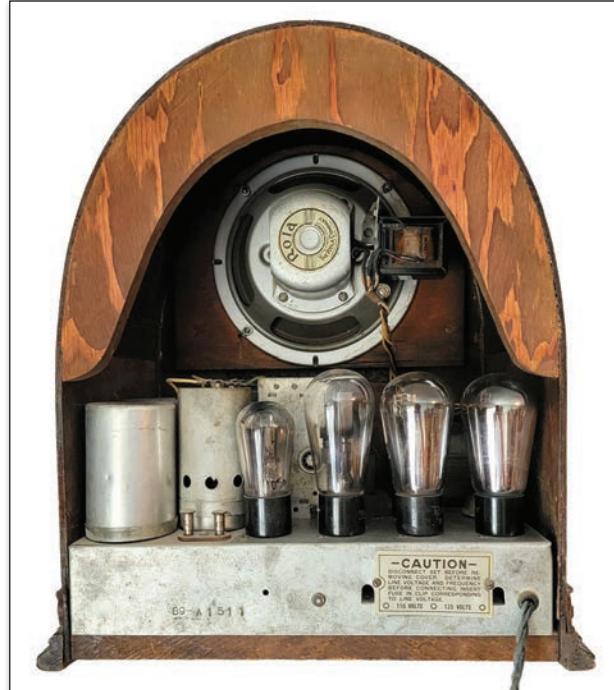
Model 89 Rear View
Note the square I.F. cans and rear speaker plug

Jackson-Bell Model 89-A Chassis

Later in 1931, Jackson-bell introduced the model 89-A chassis, with almost identical circuitry as the 89 chassis. The newer chassis had a new layout, with a version B "Full Vision Dial" mechanism. In Jackson-Bells advertising both sets are referred to as model 89.

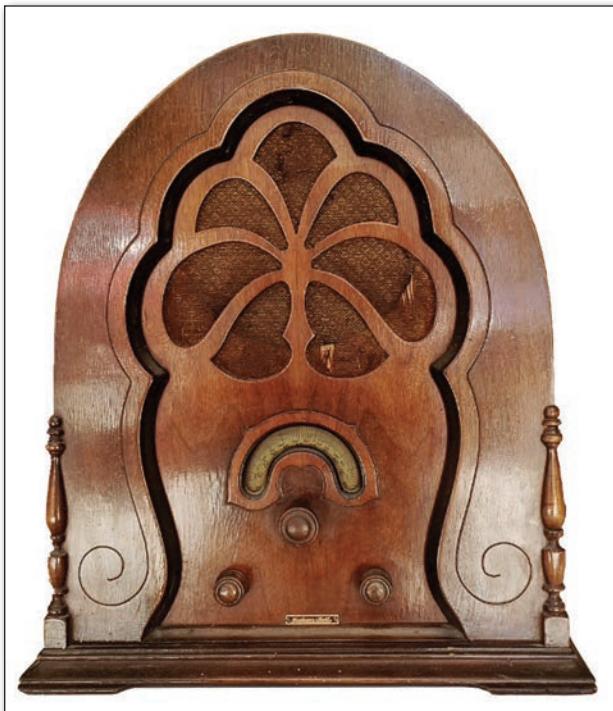


Model 89 with the 89-A Chassis



Model 89-A Chassis

Note the round IF cans and chassis top speaker plug



Model 89 Later Full Vision Dial Version

There are three R.F. tuned circuits to give excellent image rejection. There is an R.F. amplifier, to give weak signal sensitivity. There is an intermediate audio amplifier, with push-pull speaker amplification. The volume on even the weakest stations is excellent.

A Cautionary Note:

You may see some of the radios covered in this article on the internet or in reference guides with a different model number or other incorrect information. A printed error tends to replicate itself and become very prevalent.

In addition, Jackson-Bell radios exist with custom branding that does not clearly indicate the manufacturer.

We have spent nearly eight years in detailed and exhaustive research into the manufacture of Los Angeles radios and are very careful not to publish unverified results.

Jackson-Bell Model 86

Jackson-Bell also offered a "Down-Market" (less expensive) Superheterodyne in the model 86. The set has six tubes, a "peep-hole" dial, and tiny tulips in the grille.

This set is a direct follow-on to the Flint design and uses rectangular I.F. cans.

AND NOW !
THE LATEST 1932 MODEL

JACKSON-BELL

6-TUBE

Superheterodyne

MANUFACTURER'S
LIST PRICE
TODAY.

\$49⁹⁵

OUR PRICE

\$29⁹⁵ Complete with Tubes

IT HAS:

Latest VARIABLE-
MU Type Tubes

Big, Powerful
MAGNAVOX

Dynamic Speaker

Fully R C A
Licensed

PENTODE
Power Tube

KILOCYCLE
Tuning Dial

Superb Walnut-
Finished Cabinet

\$5
DOWN
\$5 a Month

Never to our knowledge has any 6-TUBE SUPERHETERODYNE been offered under \$49.95, and here is a genuine Jackson-Bell \$20.00 below that price—a saving of 40%. Exclusively at Modern Music Stores.

Just 43 of Them, So Come Early

MODERN MUSIC STORES INCORPORATED

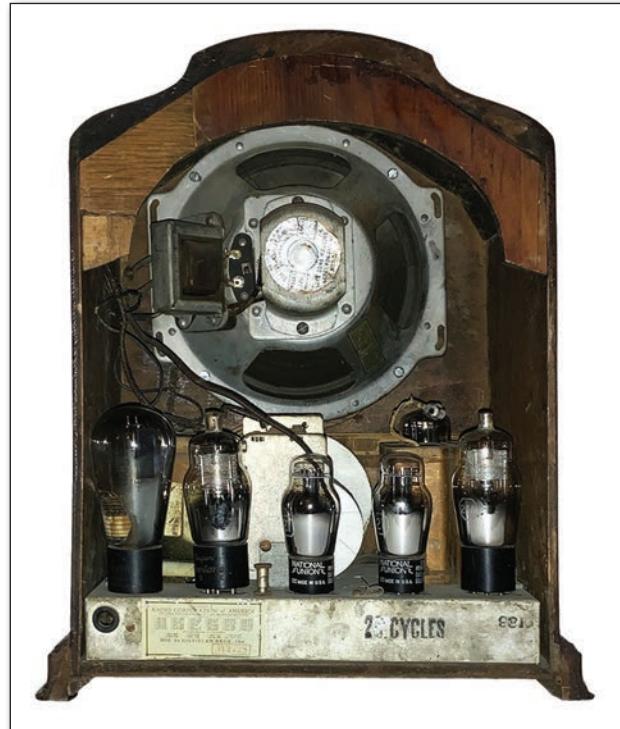
SALMACIA BROS.

PASADENA 466 E. Colorado 417 South Hill St. MUtual 8075 Open Evenings GLENDALE 118 S. Brand

*The Daily News, Los Angeles, CA
27 October 1931 - Page 4*



*Model 86 Front View
(Grill cloth is not original)*



Model 86 Rear View

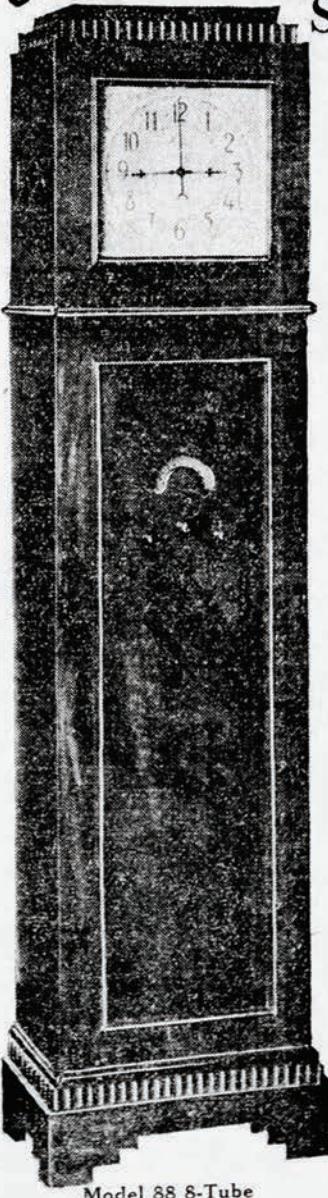
Refer to the block diagram for the model 86 on page 25 to follow this description.

There are three R.F. tuned circuits to give adequate image rejection. There is no R.F. amplifier, and no intermediate audio amplifier resulting in modest volume and sensitivity to weak signals.

Jackson Bell

Makes the Most

Sensational Contribution to Radio



THE
**JACKSON-BELL
CLOCK MODEL**

Model 88 Chassis

\$88.50
Complete
With 8
Tubes

at

Hammond Electric Clock Variable Mu Tubes
Pentode Power Tube Screen-Grid Super-Heterodyne
Walnut or Mahogany Finish Cabinet

This wonderful Clock Radio will give you reception beyond anything you have been expecting . . . regardless of price. Such outstanding features as a genuine Magnavox dynamic speaker, full-tone control and semi-automatic volume control give value far beyond the cost. Play the radio yourself. See how easily it tunes . . . how cleanly it clicks the stations in and out . . . how it reaches out for distant stations. See it! Hear it! . . . and you'll BUY IT!



**Jackson-Bell
PETER PAN**

Complete
With
Tubes **\$29.95**

A miraculous set made possible by using the full efficiency of the Pentode Power Tube. The Jackson-Bell engineers perfected this "Wrist Watch" of radios for home, camp or office. No higher than your telephone.

**A JACKSON-BELL RADIO
to Fit Any Pocketbook**

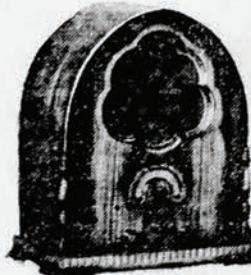
Model 84, PETER PAN—Pentode Powered	\$29.95
Complete with tubes . . . for home, office, or club.	
As high as your telephone.	
Model 86, 5-Tubes—Screen-Grid Circuit	\$37.95
Using the new Pentode power tube.	
Model 87, 7-Tube, Screen-Grid, Super-Heterodyne	\$49.95
Uses new variable-MU and Pentode tubes, tone control.	
Model 88, 8-Tube, Screen-Grid, Super-Heterodyne	\$59.50
Magnavox dynamic speaker, variable MU and Pentode power tubes; full tone control.	
Model 89, 9-Tube, Screen-Grid, Super-Heterodyne,	\$69.50
2 Pentode, 3 variable MU tubes, tone control, electrolytic-filter condenser, select walnut cabinet and many other features.	

**This 7-Tube
JACKSON-BELL**

A Big Value
at a Low
Price **\$49.95**

Complete With Tubes

This 7-tube screen-grid super-heterodyne Radio developed by Jackson-Bell to take full advantage of the new Variable MU and Pentode tubes. Full vision dial.



Model No. 87

A handsome selected walnut console cabinet may be had for any Jackson-Bell model (with the exception of the Peter Pan) at an additional cost of \$10.00.

William B. McNamara Distributing Co.

Formerly Echophone Co.

6265 Delmar Blvd.

Phone CABany 2537

Model 86, 87, 88 & 89 "Family" Advertisement

The St. Louis Star and Times, St. Louis, Missouri, 23 September 1931 - Page 9

This newspaper clipping contains most of the "family" of radios covered in this article. The text contains an error that probably occurred when the ad was composed. Model 86 is a 6-tube radio but is instead listed as a 5-tube set in this page layout. The phone exchange name is also incorrect. It should be Albany 2537.

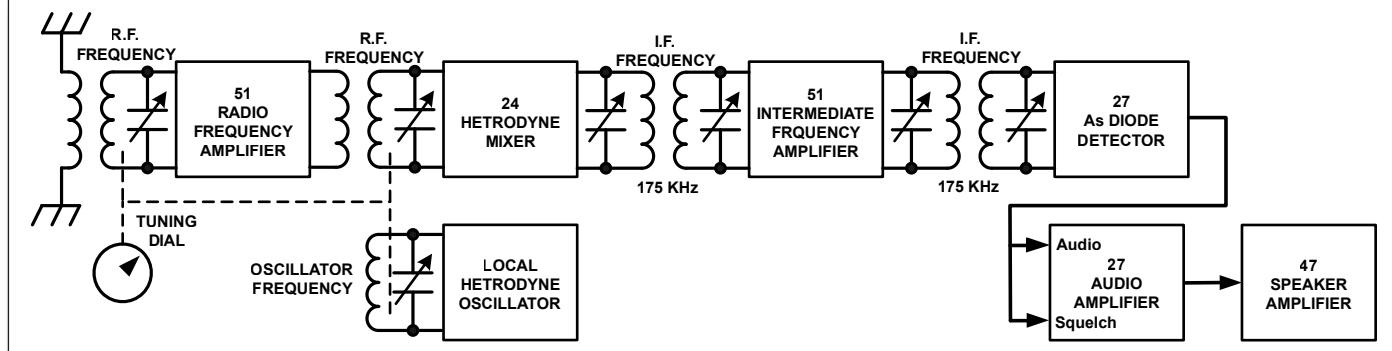
Block Diagrams

The diagrams below are presented in the order in which they are covered in the article. Refer to the descriptor accompanying the article on the page associated with these chassis.

Note: All of these sets are intended for local or regional reception.

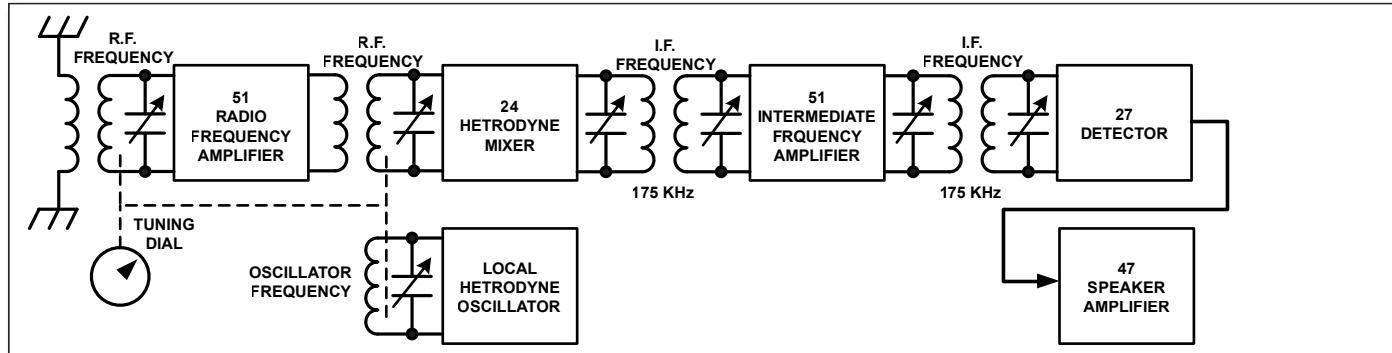
Model 88

Operational chassis description is on page 20



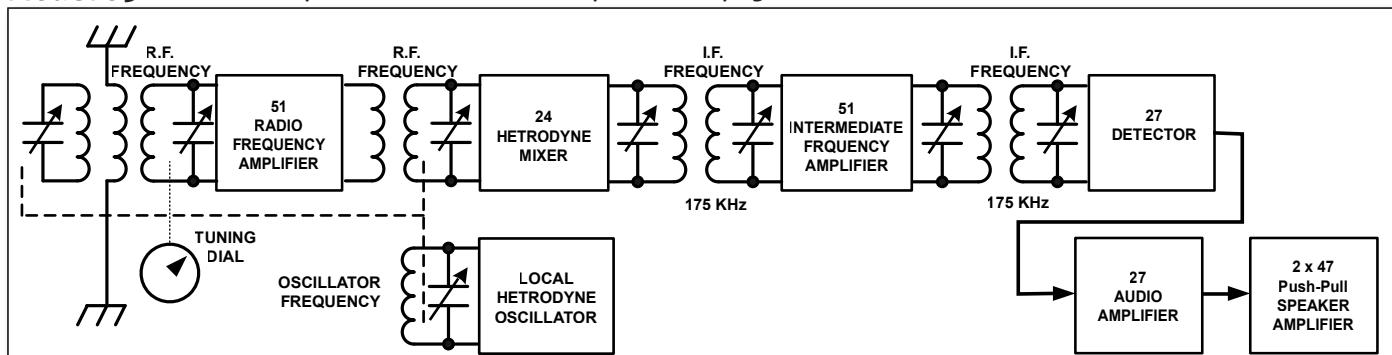
Model 87

Operational chassis description is on page 20



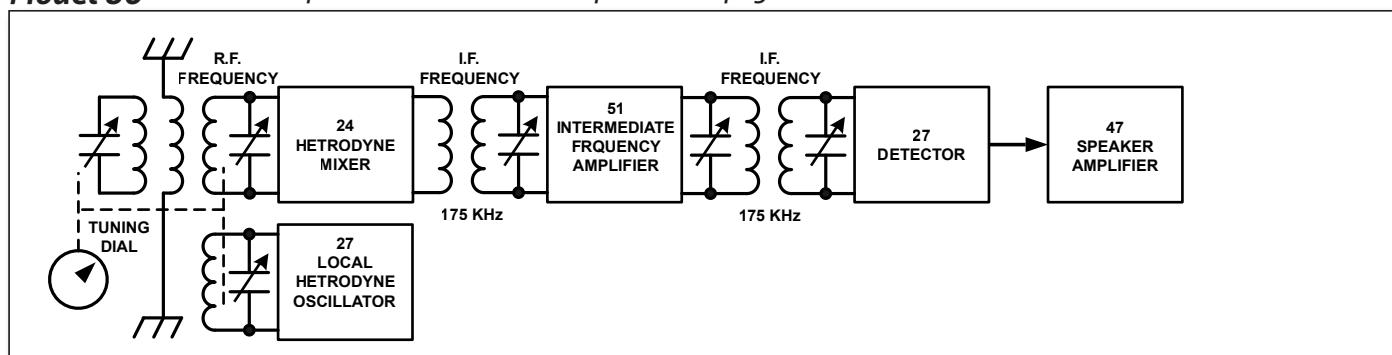
Model 89

Operational chassis description is on page 22



Model 86

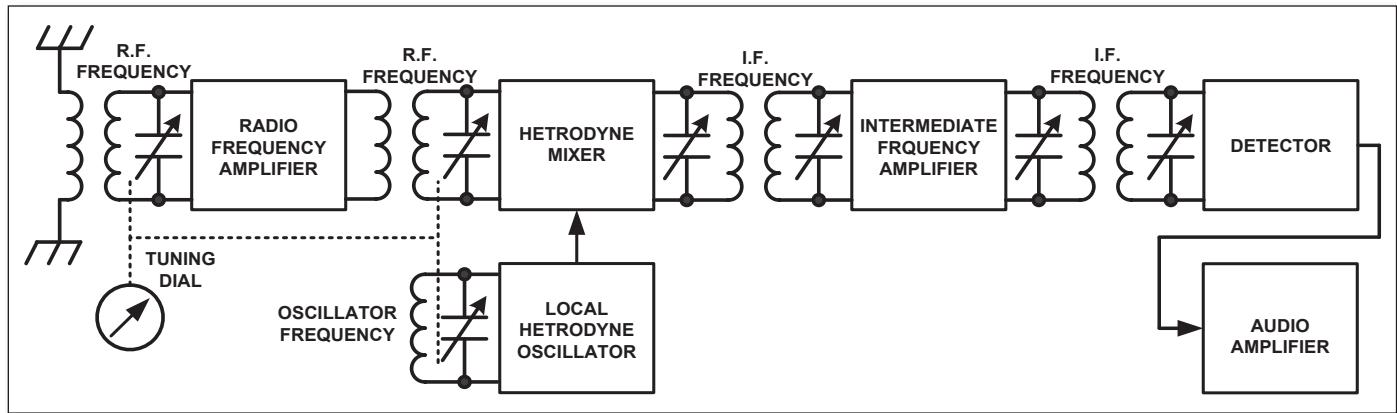
Operational chassis description is on page 23



Superheterodyne Radio Basics

In the early days of vacuum tubes, radio frequencies were very hard to amplify. In 1913 Edwin Howard Armstrong invented a method for resolving that issue. The superheterodyne radio concept was to create a circuit where the incoming frequency of the radio signal shifted to a lower intermediate frequency for amplification and detection. The benefit of this design is that tuning and selectivity are independent of one another. As vacuum tube performance improved, selectivity became the primary benefit. As a result, nearly all radio receivers today employ this design principle.

Typical Superheterodyne Receiver Block Diagram



A Closer Look:

Armstrong employed a well-understood musical concept that is referred to as 'beat frequencies'. He used a local heterodyne oscillator to "beat" with the input signal to create a lower intermediate frequency before amplification and detection.

The design requires several coordinated elements working together. The R.F. stages must assure that only a small range of the broadcast band gets to the heterodyne mixer. A local heterodyne oscillator is needed to beat with the incoming signal. A tuning capacitor with multiple sections on a single shaft usually controls these stages.

The resultant intermediate frequency (I.F.) is amplified for sensitivity and tuned to provide the selectivity to reject adjacent stations.

Superheterodyne Advantages Over TRF:

There are fewer frequency adjustable stages, making it easier to achieve high gain, and the bandpass is independent of the received frequency.

Superheterodyne Shortcomings:

There are two I.F. images due to the local

heterodyne oscillator, creating "sum" & "difference" frequencies from the incoming signal. The lower 'difference' frequency is used since the greater oscillator frequency might produce local oscillator harmonics within the broadcast band.

The oscillator and heterodyne mixer can be tuned to allow higher I.F. frequencies.

The higher the I.F. frequency, the greater the spacing of the difference & sum image signals, making the R.F. section selectivity easier to achieve.

However, the greater the I.F. frequency, the more tuned I.F. stages are required to obtain sufficient adjacent channel selectivity.

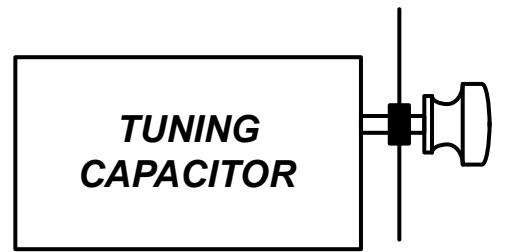
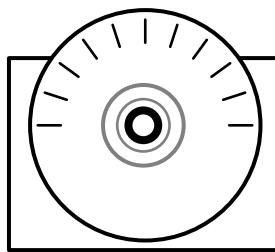
In General:

More stages in the superheterodyne design mean more gain and greater sensitivity to weak signals. With more R.F. tuned circuits, there is less sensitivity to unwanted images and spurious signals (often referred to as 'birdies'). More I.F. tuned circuits result in better selectivity and less interference from adjacent stations.

Knob Placement, Dial Drives, and Tuning Capacitor Connection

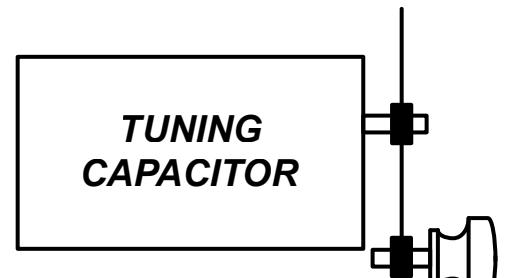
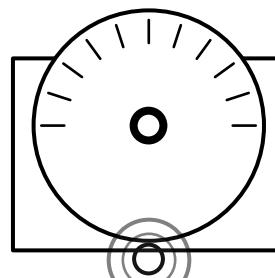
The dial can be viewed through an escutcheon or peephole opening. The dial can be front-lit or if the dial is transparent, it can be back-lit. In some cases, the dial can be fixed and the visible pointer is the only thing that moves. The basic drive types are covered below.

Direct Drive:



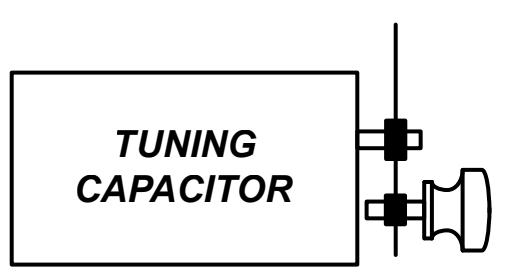
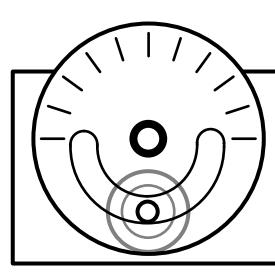
In line, Direct Drive is used on some Jackson-Bell radios. The tuning capacitor, dial (pointer), and knob share the same shaft. The tuning Knob is often larger than the others, to give more precise control. Accurate positioning of the dial is difficult to achieve. This setup is only suitable for radios with modest selectivity.

Outer Rim Drive:



Outer Rim Drive is found on older high-end Jackson-Bell radios. The mechanism gives a large reduction ratio in a small space. This design does have a quirk, the knob turns in the opposite direction from the dial. This is due to the small wheel on the knob shaft that contacts the outer rim of the dial on the tuning capacitor shaft.

Inner Rim Drive:



Inner Rim Drive is used on most of the later Jackson-Bell upscale offerings. A small wheel on the knob shaft contacts a cutout area in the tuning capacitor shaft mounted dial. The knob and dial both turn in the same direction.

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