

How to Buy a Radio

The question is asked by innumerable consumers. CU's radio experts tell—point by point—how to go about it

● At the request of many members, CU has changed its testing schedule for radio sets to bring it into closer conformance with the industry's new model seasons. Ratings of higher-priced sets to follow the November ratings of inexpensive 1941 models will, therefore, be presented later in the year.

Coincidentally, it should be pointed out that the purchase of higher-priced sets is a dubious procedure at the present time because of the revolutionary changes which radio reception is undergoing as the result of Frequency Modulation. Until the new requirements of FM are more thoroughly met by the industry, many sets face a shortened service life through obsolescence.

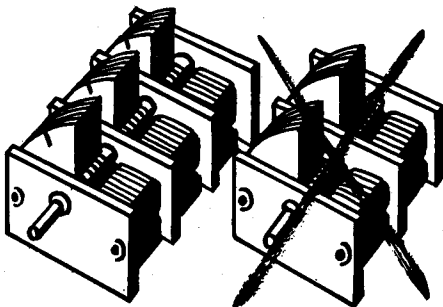
Recognizing that many people will want to buy higher-priced sets, despite possible limitations with respect to FM, CU presents here a special report analyzing on the basis of expert technical evaluations what and what not to look for.

BETWEEN \$30 and \$100 you should be able to find lots of first-rate radio receivers. The sad fact is that you will not. The simple and basic requirements of a really good receiver are not to be found in more than a few models.

The person whose radio tastes are simple and whose radio knowledge is slight will probably find most of the models adequate. That is, they will bring in ordinary broadcasting with ordinary effectiveness. They will sound all right—to a listener who is not familiar with good reception or just doesn't care.

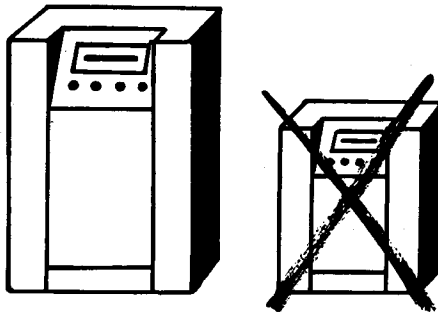
The evaluations in this report are not drawn up with such easy standards in mind. What is presented here is a radio technician's analysis of the factors that would influence his purchase of a radio set in this price range, toward the end of getting the best possible reception. The demands made are wholly realistic, because widely sold sets are available which meet them on all or most counts.

FIRST REQUIREMENT is a three-gang condenser. It sounds technical, but it's simple enough and it's something you can see if you look for it. The condenser is the battery of metal plates which moves back and forth between other plates as you tune in different stations. It *should* consist of three sections (hence "three-gang") of about 10 plates each. Any additional sections of two or three plates are not to be counted, as they are special short-wave ("band-spread") condensers. It may consist of only two



sections—as it does in all *Philco* models, for example. The extra section helps in cutting down interference between adjacent stations and is mandatory if so-called image whistles are to be excluded.

Try out any set you're thinking about buying by tuning slowly and continuously from one end of the dial to the other, listening for any whistle that comes in high, falls off to low, and goes out high again. That's an image whistle. It's not to be confused with the continuous tone of steady pitch that sometimes comes in with a station. That's only a heterodyne whistle and it happens only if and when two stations are working closely together on the dial. To avoid this heterodyne kind of whistle, the Federal Communications Commission is reassigning station frequencies effective March 29, 1941.



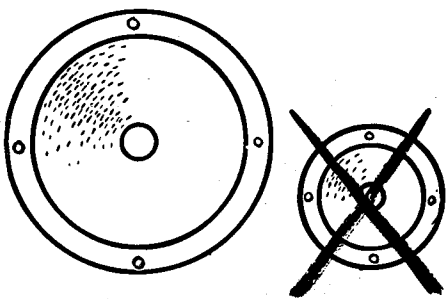
SECOND REQUIREMENT is that the cabinet be a large, solidly built console, which is basically necessary to the true reproduction of bass tones. Putting a small radio into a large cabinet may be smart salesmanship, but it isn't only that. For any receiver in a small cabinet will have a poorer tone than the same receiver in a large one. Solid construction is almost equally important. A well-braced cabinet constructed of heavy panels will allow tone quality that a flimsy construction never will.

Since a radio set does duty as a piece of furniture too, it has to be considered in that light. And maybe a large console will not fit into your home, and maybe

you just don't like large consoles. If so, apply the principle as closely as you can. That is, get the largest cabinet your space and your tastes allow.

THIRD REQUIREMENT is a properly mounted 10- or 12-inch speaker (the reference is to the diameter of the front circle of the speaker). Bass tones will come through inadequately from an 8-inch speaker in an ordinary radio cabinet. An 8-inch speaker may prove satisfactory only if special cabinet construction is used, such as "bass reflex" or "acoustic labyrinth."

Look for the speaker that is mounted as nearly as possible in the center of the cabinet front and always select a cabinet with a full bottom. This will give you purer, lower and louder basses. Avoid radios whose speakers are designed so that they do not face the prospective listener.



FOURTH REQUIREMENT is an undistorted power output between 5 and 10 watts. (This is not as wide a wattage range as it might seem; the difference between 5 and 10 watts output is no more than discernible to the ear.) "Undistorted power output" is the term used to describe the electrical power that is directly consumed in the loud speaker in the production of the loudest, pure (undistorted) sound. More power (wattage) can usually be pumped into the speaker by the simple expedient of turning up the volume control. But a louder volume level will invariably be accompanied by distortion.

Though an enterprising radio salesman may try to sell you on the idea that you need more than a 5- to 10-watt undistorted power output—because a machine with a larger output is more expensive—this range is adequate even if your taste runs to brass bands and symphony orchestras. Any more power capacity is wasted in a home, unless your living room is very large.

FIFTH CONSIDERATION concerns tone controls. The definite choice, if not requirement, is that there be two separate controls, one for bass, the other for treble tones. Radio technique today strives to

bring into your home a fairly exact reproduction of what goes on in the broadcasting studio. But the quality of that reproduction depends upon a number of variable factors, which affect the picture before the program actually reaches the listener's ears. In the actual reception of the program your particular mood, along with the size of the room you may be in, are also factors.

Therefore, it is desirable even in an otherwise perfect radio that there be some means for you to adjust its tone, according to your whim or studied preference. But "tone" is a balance of bass, middle register and treble notes. A conventional single control does not give a wide choice of tonal differences since the two ends of the tonal range cannot be emphasized or cut at the same time. Two separate tone controls are, for that reason, the choice. In this category such variations as push-button tone controls (*Zenith Radiorgan*) and a combination of push-button and continuously variable tone controls (*Sears', Lafayette*) may be included.

SALESTALK

Once you have an idea of what to specify in your radio and what to avoid, you then have to contend with the salesman. Because radio engineering is a complex business, the radio salesman (himself usually uninhibited by much technical knowledge) can, and often does, take advantage of the customer's confusion to expand his selling arguments.

You will be "sold" on a radio on the basis of the number of tubes it has, the thesis being the more tubes, the better. Using that type of reasoning, a 12-tube set ought to be twice as good as a 6-tuber. But it isn't. What with tube-shaped resistors and "tuning eyes," and just plain dummies passing for tubes, their number in any set loses whatever significance it might once have had. Again, the actual number of tubes means little because two and even three tubes are now often enclosed in one tube shell.

Another staple in the salesman's kit of arguments is the number of "bands"



featured in a particular set. Sets are made today with as many as six bands—that is, you can push that number of buttons or turn a switch that number of times, and your dial will give you a different frequency coverage each time. In simple terms that means you will get a different set of stations on each frequency coverage, or band. Unless you particularly enjoy listening to police calls, code signals, and amateur broadcasts, you certainly have no need for more than one band.

For the person who wants to listen regularly to foreign stations, the "spread-band" is most desirable. If there are, for example, three "bunches" or groups of broadcast stations on a single dial's length, the spread-band takes the one most important of these bunches and spreads it out over the entire length of the dial, eliminating the other two, thus greatly facilitating the ease and accuracy of tuning in to those stations. The important entertainment spread-bands are the 9 megacycle (the 31-m. band), the 12 megacycle (25-m.) and the 15 megacycle (19-m.).

Push-buttons, like bands, add to the cost of the radio and hence are heavily promoted. If their convenience is desired, then select a machine with the kind of push-buttons you can set yourself. This will enable you to reset the buttons whenever they get out of adjustment (which they sometimes have a tendency to do) without the aid of a serviceman.

See to it that the push-buttons actually work—especially that they work easily enough so the set doesn't have to have the backing of a wall when you operate them. See to it, also, that you can always tune in the stations satisfactorily, using the buttons. The mechanical type—where the dial rotates when the button is pushed—has the advantage of allowing accurate tuning by hand, once a program that satisfies you has been selected.

Metropolitan dwellers will find the so-called loop antenna a great convenience. To the eye, it consists only of several turns of wire, some 12 inches in diameter, built inside the radio cabinet. This simple apparatus obviates any necessity for aerial or ground connections, with the attendant serviceman's charges and possible unsightliness. In rural areas,

Note on Small Radios

CU has been informed that the "Best Buy" radio rated in the November 1940 Reports and in the December 1940 Buying Guide edition has suffered an increase in its list price. The Crosley 24AU table model now lists at \$34.95—an increase of \$5 over the former price of \$29.95. At this price it is not directly comparable to the other makes rated since no radios above \$30 were tested.

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where an outside antenna may be necessary to reach a sufficient variety of stations, the loop may be found to be of less value.

Preferable to the fixed loop is the rotating loop; and one that can be rotated around half a circle is better than one whose rotation is limited to a quarter of a circle. A rotating knob on the front panel of the cabinet is desirable with this type of antenna. Test a rotating loop antenna by tuning in to a weak station and then turning the loop. If the rotation produces either a decrease or an increase of volume or noise, the loop is bona fide; if not, it may just be a piece of antenna wire placed so as to imitate a loop.

There are other features in a radio which you may want, and which will add both to its usability and its cost. The "tuning eye," terminals for connecting a record player, and a front-panel switch for choosing either radio or record player reproduction are among such features.

Salesmen will also often make much over the quality of "automatic bass compensation." This means that the radio will have about the same balance of tone playing loudly as it will when playing softly. Because its cost is negligible, automatic bass compensation is almost universally used in radios today.

In making a final check-up on the radio that you intend buying, test the functioning of the tone controls and listen for hum. A full change of either the treble or bass tone controls should produce a considerable change in the corresponding tones of a musical program. Hum will probably be heard on any radio operating on alternating current if you bend down close to the speaker. It should not be heard when the volume control is turned down to a point where no program is audible, when you are listening in a quiet room as close to the speaker as you normally might stand. If hum is heard under these circumstances, chances are it will develop and grow worse as the set gets older.

Major Features of 50 Models of Higher-Priced Radios

Data given in bold type in the table below meet conditions for a satisfactory radio as discussed in the accompanying report.

All of the radios listed are a-c models and all contained provisions for attaching a record player. "Phonograph switch" means a switch on the front panel for changing from radio to records. "R.f. stage" refers to the use of one stage of radio frequency amplification, which increases sensitivity to distant stations. "Bass reflex" refers to a special cabinet construction which improves bass response. "Noise limiter" means a special circuit which, when operating properly, minimizes static and other crackling interference. "Adjustable selectivity" means a switch which permits better reception of high treble tones (but at the cost of more static).

BRAND AND MANUFACTURER OR DISTRIBUTOR	MODEL AND PRICE (\$)	SECTIONS IN CONDENSER	CABINET SIZE	SPEAKER SIZE (INCHES)	OUTPUT (WATTS)	TO NE CONTROL	FEATURES AND REMARKS
Admiral (Continental Radio & Television Corp., Chicago)	56-A77; 49.95-59.95*	2	Small	10	Unsatisfactory ¹	Single continuous	Rotating loop. 6 push-buttons. R.f. stage. Compare with Allied Knight B10571
Allied Knight (Allied Radio Corp., Chicago)	B10571; 31.45	2	Small	10	Unsatisfactory ¹	Single continuous	Rotating loop. 6 push-buttons. R.f. stage
	B10578; 43.95	2	Medium	12	5	Single continuous	Rotating loop. 6 push-buttons
	B10577; 32.95	2	Chair-side	10	5	Single continuous	Loop. 6 push-buttons
	B10570; 54.95	2	Large	12	7	Single 4-point	Rotating loop. Phonograph switch. Tuning eye. 6 push-buttons. R.f. stage. 3 spread bands
Crosley (Crosley Radio Corp., Cincinnati)	24 AV; 39.95*	3	Small	8	Satisfactory ³	Single continuous	Loop
	25 AX; 54.95*	3	Small	8	Satisfactory ³	Single continuous	Rotating loop. 6 push-buttons
	25 AY; 64.95*	3	Medium	10	Satisfactory ³	Single continuous	Rotating loop. 6 push-buttons
	26 BB; 69.95*	3	Medium	12	Unsatisfactory ¹	Single continuous	Rotating loop. 6 push-buttons. R.f. stage
Emerson (Emerson Radio & Phonograph Corp., N.Y.C.)	368; 49.95*	2	Small	12	Unsatisfactory ¹	Single 2-point	Loop
	369; 79.95*	2	Medium	12	12 ²	Single 3-point	Rotating loop. 6 push-buttons
Farnsworth (Farnsworth Television & Radio Corp., Marion, Ind.)	BC-601; 69.95*	3	Medium	12	Unsatisfactory ¹	Single 4-point	Phonograph switch
	BC-82; 79.95*	2	Medium	12	Unsatisfactory ¹	Double continuous	Rotating loop. Phonograph switch. 6 push-buttons. R.f. stage
	BC-80; 74.95*	2	Medium	12	Unsatisfactory ¹	Single continuous	Rotating loop. Phonograph switch. 6 push-buttons. R.f. stage
	BC-81; 79.95*	2	Medium	12	Unsatisfactory ¹	Single continuous	Rotating loop. Phonograph switch. 6 push-buttons. R.f. stage
Lafayette (Lafayette Radio Corp., N.Y.C.)	JS-129; 34.95	2	Small	12	Satisfactory ²	Single continuous	Rotating loop with front knob. Phonograph switch. Tuning eye
	B-101; 54.50	3	Medium	12	9.5	Single continuous	Rotating loop with front knob. Phonograph switch. Tuning eye. 6 push-buttons. R.f. stage
	FE-149; 64.50	3 ⁴	Large	12	10	Double 3-point	Rotating loop. Phonograph switch. Tuning eye. 5 push-buttons. R.f. stage. 4 spread-bands
Philco (Philco Radio & Television Corp., Philadelphia)	258-F; 39.95*	2	Small	10	1	None	Loop
	260-F; 49.95*	2	Small	10	2	Single continuous	Rotating loop. Phonograph switch. 5 push-buttons
	265-K; 59.95*	2	Small	10	2	Single continuous	Rotating loop. Phonograph switch. 5 push-buttons
	280-X; 69.95*	2	Medium	12	2	Single continuous	Rotating loop. Phonograph switch. 7 push-buttons
RCA (RCA Mfg. Co., Camden, N. J.)	16-K; 49.95*	2	Small	12	2.5	Single 3-point	Loop. Phonograph switch. 5 push-buttons. R.f. stage
	17-K; 59.95*	2	Medium	12	2.5	Single 4-point	Loop. Phonograph switch. 6 push-buttons. R.f. stage
	19-K; 79.95*	2	Large	12	5	Single 4-point	Rotating loop. Phonograph switch. 6 push-buttons. R.f. stage

BRAND AND MANUFACTURER OR DISTRIBUTOR	MODEL AND PRICE (\$)	SECTIONS IN CONDENSER	CABINET SIZE	SPEAKER SIZE (INCHES)	OUTPUT (WATTS)	TO NE CONTROL	FEATURES AND REMARKS
<i>Sears' Silvertone</i> (Sears-Roebuck)	671; 34.95†	2	Small	8	2.5	Single 3-point	Loop. 6 push-buttons
	701; 47.95†		<i>Medium</i>	10		<i>Double 2-point</i>	Rotating loop. Phonograph switch. Tuning eye. 6 push-buttons. 2 spread-bands
	6490; 59.95†	2	<i>Large</i>	10	3	Single 3-point	Rotating loop. Tuning eye. 6 push-buttons. 1 spread-band. Breakfront lowboy (Hepplewhite)
	721; 69.95†	3	<i>Medium</i>	12	8	<i>Double (combination)</i>	Rotating loop. Phonograph switch. Tuning eye. 6 push-buttons. R.f. stage on broadcast band only. 3 spread-bands. Bass reflex. Noise limiter
<i>Sentinel</i> (Sentinel Radio Corp., Evanston, Ill.)	221-C; 69.95*	2	Small	10	7 ²	Single continuous	Rotating loop. 6 push-buttons
<i>Stewart-Warner</i> (Stewart-Warner Corp., Chicago)	6U7; 54.95*	2	Small	8	Unsatisfactory ¹	Single 3-point	Loop. Tuning eye. 5 push-buttons
	8F7; 64.95*	2		10	Unsatisfactory ¹	Single 3-point	Loop. Phonograph switch. 6 push-buttons. R.f. stage
	9B6; 74.95*	2	<i>Large</i>	10	<i>Satisfactory</i> ³	Single 3-point	Loop. Phonograph switch. 6 push-buttons. R.f. stage
	9B7; 79.95*	2		12	<i>Satisfactory</i> ³	Single 3-point	Loop. Phonograph switch. 6 push-buttons. R.f. stage
<i>Stromberg-Carlson</i> (Stromberg-Carlson Telephone Mfg. Co., Rochester, N.Y.)	420F; 79.95*		Small	12			Tuning eye. Push-buttons. Maple
	520L; 79.95*	2	<i>Medium</i>	12	Unsatisfactory ¹	Single 4-point	Loop. Phonograph switch. Tuning eye. 6 push-buttons. R.f. stage
<i>Ward's Airline</i> (Montgomery Ward)	619; 27.88†	2	Small	8	1.7	Single continuous	Loop. Phonograph switch
	907; 47.95†	3 ⁴	<i>Medium</i>	10	5	Single continuous	Loop. Phonograph switch. Tuning eye. 6 push-buttons. R.f. stage. 4 spread-bands
	903; 52.95†	3	<i>Medium</i>	10	5	Single continuous	Loop. Phonograph switch. Tuning eye. 6 push-buttons. R.f. stage. 4 spread-bands
	1105; 65.95†	3 ⁴	<i>Medium</i>	12	10	<i>Double 3-point</i>	Loop. Phonograph switch. Tuning eye. 6 push-buttons. R.f. stage. 4 spread-bands. Adjustable selectivity
<i>Westinghouse</i> (Westinghouse Electric Supply Co., NYC)	WR-386; 54.95*	2	<i>Medium</i>	12	2.25	Single 3-point	Loop. Phonograph switch. 6 push-buttons. R.f. stage
	WR-375; 59.95*	2	Small	12	2.5	Single 2-point	Rotating loop. Phonograph switch. 6 push-buttons
	WR-388; 79.95*	2	<i>Large</i>	12	5	Single 4-point	Rotating loop. Phonograph switch. 6 push-buttons. R.f. stage
<i>Zenith</i> (Zenith Radio Corp., Chicago)	6S546; 39.95*	2	Chair-side	6	6 ⁵	<i>Double 2-button</i>	Rotating loop. Phonograph switch. 5 push-buttons. R.f. stage
	6S556; 49.95*	2	Small	10	6 ⁵	<i>Double 2-button</i>	Rotating loop. Phonograph switch. 5 push-buttons. R.f. stage
	7S547; 49.95*	2	Chair-side	8	6.5 ⁵	<i>Double 6-button</i>	Rotating loop. Phonograph switch. Push-buttons. R.f. stage
	7S557; 59.95*	2	<i>Medium</i>	10	6.5 ⁵	<i>Double 6-button</i>	Rotating loop. Phonograph switch. Push-buttons. R.f. stage
	7S558; 69.95*	2	<i>Medium</i>	10	6.5 ⁵	<i>Double 6-button</i>	Rotating loop. Phonograph switch. Push-buttons. R.f. stage
	8S563Z; 69.95*	2	<i>Medium</i>	14	6 ⁵	<i>Double 6-button</i>	Rotating loop. Phonograph switch. 6 push-buttons. R.f. stage
	8S548; 74.95*	2	Chair-side	8	6 ⁵	<i>Double 6-button</i>	Rotating loop. Phonograph switch. 6 push-buttons. R.f. stage

* Manufacturer's list price. † Plus transportation. ¹ Unsatisfactory: undistorted output believed to be less than 5 watts. ² Published output: undistorted output believed to be lower than stated, but still 5 watts or more. ³ Satisfactory: undistorted output believed to be 5 watts or more. ⁴ Equivalent to a 3-gang condenser. ⁵ Published output: undistorted output believed to be less than 5 watts.