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RECEIVER REVIEW: SONY SRF-A100
Greg Monti 19 Feb 84

The SRF-A100 is the first low-cost entry into the AM stereo receiver market. It is styled like a "mini boom box," if you will, with 3-inch speakers astride a central AM-FM slide-rule dial. Controls and connectors are along the left and top edges of the unit. On the left edge are a power jack for an AC adapter (optional), stereo headphones (a 1/8 inch phone jack for "walkman type" headphones, also not included), and an AM stereo mode switch (more on that later). Along the top edge are the power switch, volume and tone controls, a two-position switch which doubles as an FM "local/distant" switch and an AM IF bandwidth "wide/narrow" switch, a three-position band switch for FM stereo-AM stereo-AM mono, and the tuning knob. An FM monopole antenna is built in and tucks along the rear of the top edge of the receiver. The AM antenna is a ferrite bar and is built in. The speakers are three inches in diameter and only about 6 inches apart on centers. This Sony receiver line has since been added to by Sony's Walkman version, the SRF-A1, which apparently is identical except for size and lack of speakers.

Operation: The SRF-A100 receives all four AM stereo systems currently in use (Harris, Kahn, Magnavox and Motorola) although switching between systems is only semi-automatic and switching between AM mono and AM stereo is totally manual. Apparently, since the same stereo decoding circuit can be used to receive the Harris, Magnavox and Motorola systems, a two-position AM stereo mode switch is provided with one position for those three systems and the other position for Kahn. If you listen to an AM stereo station with the switch in the "wrong" position, you'll still hear what appears to be a stereo effect, but careful listening will reveal that the effect is sort of "random" and that instruments and voices do not occupy fixed positions on the "stereo stage." The label on the bottom has a reminder on it as to which systems are received in which AM stereo mode switch position. You have to find out which system your favorite station is broadcasting in yourself.

There is a center tuning light which functions on both AM and FM but there is no "stereo" pilot light for either AM or FM since the AM section doesn't have or doesn't use the necessary pilot tone detector circuitry to perform this function. If such a circuit were used, it could also perform automatic switching between AM stereo systems allowing the receiver to operate in an "idiot proof" mode like FM stereo receivers do. This was obviously not done to reduce costs (the list price is about \$90, I phone-ordered mine from 47th Street Photo in New York for about \$80 plus shipping). If you switch to AM stereo while listening to a mono station, the station will continue to be heard in mono, but the background noise will be in stereo, giving a sort of "fool's stereo effect." The tuning light is definitely useful as, with it off, you can't receive stereo at all on FM. On AM, you must generally have the tuning lamp lit to receive stereo. If the station is weak, the tuning lamp won't light, but you can still receive stereo (albeit noisy) if you center tune the station carefully.

AM performance: with one exception, it's stunning. The two-position AM IF bandwidth switch makes a remarkable difference. In the "narrow" position, the unit sounds about like a typical AM radio: tinny, boxy, and especially lacking high frequency audio content. In "narrow," the selectivity is also quite good with adjacent-channel domestic stations usually quite audible next to each other. In "wide," the selectivity is noticeably broader and the audio greatly improved. On a strong, quiet local with reasonable audio processing, you might be hard pressed to tell the difference between AM and FM. However, strong, quiet locals are the exception, not the rule. Most of anybody's local AM's will experience some degree of first- or second-adjacent channel interference and this form of interference will be audible as extraneous noises especially in wideband mode.

The most useful AM engineering feature of this radio is that it has a very tight, very wide range automatic gain control (AGC). In effect, this makes the AM section operate and sound like FM, a substantial advantage. In the daytime, between stations, instead of hearing virtual silence with some low-level noise, you hear the RF noise floor converted into audio hiss and almost at audio program level, the same way any FM radio sounds (with its

muting off). If you're listening to a station which is fading (changing in RF level) the volume of the audio program does not go up and down with the fades, the background noise comes up as the signal gets weaker and then fades back down as the signal gets stronger; the program level stays constant. Local stations of different strengths are not heard at different loudnesses, they're all substantially the same. This is exactly the way FM receivers behave and may be a good selling point for this receiver to the general public although I'd doubt that the general public would know *why* they like it. Low power AM broadcasters may also like this feature since it prevents the public from tuning only to the "loudest" (i.e., strongest) stations on the dial by making them all the same. The AGC is not mentioned in the instruction sheet.

The only fault I can really attribute to the receiver is that the audio section is noticeably noisy. Even on strong locals in mono, there's a fair amount of hiss behind the audio. It's not serious, but it is audible. The hiss remains and has the same high-frequency content even when the bandwidth is switched to narrow, indicating that the hiss is not coming from the RF or IF sections. When you switch to narrow, the audio program gets muddier and no longer covers up the high-frequency part of the hiss, making it more obvious. This may limit the SRF-A100's usability as a DX receiver since it, in effect reduces sensitivity. The tone control can reduce it appreciably, but you'll have to compromise on how much of that high-fidelity audio you want to cut out along with the hiss.

This radio also has a habit of exposing sloppy engineering practices at individual AM stations. The amount by which the audio improves when switching from narrow to wide depends on the station. Some stations, especially with critical or complicated directional patterns, have their antennas tuned so tightly, that sidebands representing the higher audio frequencies never get through and the audio still sounds somewhat muddy. Some mono AM stations have a transmitter which incidentally phase-modulates the carrier with the station's audio. This defect would be inaudible on a mono receiver but shows up immediately when listening in the Harris-Magnavox-Motorola stereo mode as gross channel imbalance accompanied by obvious distortion. WLIB 1190 in New York and WTOP 1500 in Washington, both mono stations, have been noted to have this defect. Some mono stations, however, are impeccably engineered and show no such problems. WCBS 880 in New York is clean; it sounds the same with the receiver in stereo or mono mode with only a tiny (when listening locally) addition of stereo noise in stereo mode.

Listening: Since the speakers are only about 6 inches apart, the stereo effect is somewhat anemic. Headphones are recommended. For listening where you don't care about the stereo effect, the speakers are real gems, with excellent frequency response and low distortion even at high volume. The "definition" of voice from these speakers is commendable. The speakers accomplish this with very strong magnets and you should be careful to keep credit cards, cassette tapes, computer disks and such away from this radio. AM stereo listening can be quite disarming especially when listening to a distant station. There's only one AM stereo station in my market, but virtually all of the big class I-A AM's which broadcast any music operate in stereo. Even if you have to switch to narrow to avoid adjacent channel interference the stereo effect is still there.

WLS 890 Chicago is especially recommended for demonstration purposes (if you like its format) as long as it doesn't experience co-channel interference at your location. WLS uses the Harris system (last I heard). Any AM stereo system receivable by using the Harris-Magnavox-Motorola position experiences weird effects when hit with co-channel interference. In mono, on an ordinary radio, co-channel interference is usually heard as a "sub-audible heterodyne" in which the audio loudness of the desired station increases and decreases at a rate equal to the difference in frequencies of the desired and interfering stations. If the two stations are operating at frequencies two Hertz apart, the loudness will go up and down twice per second. Due to the tight AGC in the SRF-A100, it is unlikely that the audio level will run up and down in this case since the AGC will follow and compensate for most subaudible heterodynes. In these three stereo systems, however, the musical instruments and voices on the "stereo stage" move around from left to right and back again at the rate at which the audio would have gone up and down! I assume that this is due to a phase locked loop, used to decode the "left minus right" channel

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information for these three systems, being fooled by receiving two different carriers at the same time. If the desired and interfering stations are operating, say 20 Hertz apart, and you are listening in headphones, you'll have the whole thing swirling around inside your skull 20 times a second. It's quite a wild effect, but it's not likely that the recording studio that made the record wanted it quite that way. The Kahn system does not exhibit this problem.

Another advantage to stereo listening using the Kahn system lies in the way it decodes the stereo. Kahn stations use "independent sidebands" to transmit the left and right channels in a separable manner. In decoding, whatever the station is broadcasting in its lower sideband (the one extending about 15 kHz below the station's operating frequency) is routed to the left speaker by the receiver. Whatever's in the upper sideband is routed to the right speaker. If you are listening to a Kahn stereo station, for example on 630 kHz, and there's second-adjacent channel splash from a station on 610 kHz, the receiver will place the splash 'way out on the far left side of the "stereo stage" which tends to make it less objectionable. Kahn calls this the "cocktail party effect," referring to the way the human brain can cause the ears to concentrate on hearing conversation from the person directly in front while ignoring the chatter from all sides. Inventive DXers might use this property of the Kahn system to clean up reception of mono AM stations which are plagued by interference from only one side by switching to the Kahn decode mode and then listening only to the non-interfered-with sideband. Expensive communications receivers call this "selectable sideband reception;" here, you get it for less than \$100. Unfortunately, this can't be done with this receiver alone; there is no balance control so the speakers can't be "turned off" individually. You'll have to wire up something that performs the channel-switching function and plugs into the headphone jack and controls external headphones, speakers, or a feed line to your stereo system.

FM performance: This receiver does have an FM section and FM stereo but it is downright awful. The dynamic range of the FM "front end" circuitry is so restricted that only the strongest and most local FM's will come in in stereo and with reasonable quieting. The FM "local/distant" switch isn't much help since, if you switch to local in an attempt to suppress receiver-generated overload intermodulation products, the sensitivity is so low that you are still stuck listening only to the strong locals. You can raise, lower or reorient the monopole antenna and flip the local/distant switch in a constant fight to receive a favorite station that's at "suburbs distance" from you and you may never have success. For instance, I can't receive WEZR 106.7 (14 miles away) in anything resembling quiet stereo due to receiver-generated overload products coming from closer-in locals like WAVA 105.1 (4 miles) and WPKX-FM 105.9 (7 miles).

MANUFACTURER'S SPECIFICATIONS

Power supply: Three type AA batteries or external, optional AC adaptor. The instruction sheet expects a battery life of 61 hours if headphones and heavy duty batteries are used about 4 hours a day; 16 hours life with the speakers operating and regular batteries.

Frequency range: AM 530 - 1605 kHz; FM 87.6 - 108.0 MHz

Power output: 0.36 watts per channel at 10% distortion into speakers; 0.04 watts per channel at 10% distortion into headphones.

Physical: 9 in wide, 4 in high, 1-9/16 in deep; 1 pound, 2 ounces

Warranty: One year, parts and labor, although Sony reserves the right to use reconditioned parts for repairs.

AM STEREO STATIONS BY FREQUENCY
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h = Harris, k = Kahn/Hazeltine, m = Motorola, x = Magnavox, \$ = unknown
If station (or stereo equipment provider) has announced at different times that station has bought more than one system, all of them are listed. Generally, information is unconfirmed.

550 KOY AZ Phoenix k	1080 WTIC CT Hartford k
550 KSD MO Saint Louis \$	1080 KYMN MN Northfield h
550 WGR NY Buffalo h	1090 KRZY NM Albuquerque m
550 KTSA TX San Antonio k	1110 KRLA CA Pasadena k
560 WOOF AL Dothan h	1110 WBT NC Charlotte k
560 WFIL PA Philadelphia k	1140 WASG AL Atmore m
570 WSYR NY Syracuse k	1140 KMJJ NV Las Vegas x
570 KROX TX Dallas m	1140 WRVA VA Richmond \$
580 WDBO FL Orlando k	1150 WJBO LA Baton Rouge h
590 WOV NE Omaha k	1150 WHUE MA Boston \$
610 WSGN AL Birmingham k	1160 KSL UT Salt Lake City k
610 KFRC CA San Francisco k	1190 WGKA GA Atlanta h
620 KGW OR Portland m	1190 WQWO IN Fort Wayne x
630 KHOW CO Denver h	1220 WGAR OH Cleveland h
630 WMAL DC Washington h	1230 KBCR CO Steamboat Springs m
630 WQBS PR San Juan h	1230 WCUZ MI Grand Rapids h
640 KFI CA Los Angeles hm	1230 WCOL OH Columbus h
650 WSM TN Nashville hm	1240 WHIZ OH Zanesville h
660 WNBC NY New York k	1240 KTAM TX Bryan h
660 WESC SC Greenville h	1250 KPRE TX Paris h
670 WMAQ IL Chicago k	1260 KGBL CA San Fernando h
680 KNBR CA San Francisco k	1260 KOIT CA San Francisco m
680 WPTF NC Raleigh h	1260 WNDI IN Indianapolis m
680 KKYX TX San Antonio m	1270 KAJD OR Grants Pass h
700 WLW OH Cincinnati k	1270 KIML WY Gillette h
710 WGBS FL Miami k	1280 KJOY CA Stockton m
720 WGN IL Chicago hk	1280 WQUE LA New Orleans k
740 KRMG OK Tulsa m	1280 KIT WA Yakima h
740 WRPQ WI Baraboo h	1300 WOOD MI Grand Rapids k
750 KFQD AK Anchorage k	1310 WISE NC Asheville h
750 WSB GA Atlanta h	1310 KRAM TX Dallas k
760 WJR MI Detroit m	1340 WXOR AL Florence h
760 WORA PR Mayaguez h	1340 KOCY OK Oklahoma City hm
770 WJMW AL Athens h	1350 WHWH NJ Princeton hm
770 WABC NY New York k	1350 WGSW SC Greenwood m
780 KRDW NV Reno h	1360 WCHL NC Chapel Hill m
780 WCKB NC Dunn h	1370 KEEN CA San Jose h
790 WQXI GA Atlanta hk	1370 KSUM MN Fairmont h
790 KKBQ TX Houston k	1370 KXLF MT Butte h
820 WAIT IL Chicago m	1370 WSPD OH Toledo k
840 WHAS KY Louisville h	1380 WQHK IN Fort Wayne h
850 WKIX NC Raleigh h	1380 WPLB MI Greenville h
850 WHIG TN Knoxville \$	1390 WFBR MD Baltimore k
880 KJJR MT Whitefish h	1390 WCSC SC Charleston k
880 KWIP OR Dallas h	1400 WILI CT Willimantic h
890 WLS IL Chicago hk	1400 WSLC NC Statesville h
900 WATV AL Birmingham k	1410 WING OH Dayton h
910 WLAS NC Jacksonville h	1430 WIRE IN Indianapolis m
910 WPRP PR Ponce h	1430 WDEX NC Monroe h
920 KORK NV Las Vegas h	1440 WGEM IL Quincy h
920 KKLS SD Rapid City m	1440 WFTD MA Worcester k
930 KHJ CA Los Angeles k	1460 KSD IA Des Moines h
930 KOGA NE Ogallala h	1460 WBRN MI Big Rapids h
930 WSOC NC Charlotte h	1470 KRBC TX Abilene h
930 KAGI OR Grants Pass h	1470 WSAN PA Allentown m
940 KFRE CA Fresno h	1480 WISM WI Madison m
950 KJR WA Seattle h	1490 KAIR AZ Tucson h
980 KMBZ MO Kansas City k	1490 WESL IL East Saint Louis \$
1000 KOMO WA Seattle h	1500 KTOL WA Lacey x
1010 KLRN AR Little Rock h	1540 KZLA CA Los Angeles m
1010 WKQT LA Garyville m	1540 WBCO OH Bucyrus h
1010 WITL MI Lansing m	1550 KQWB ND West Fargo m
1010 WHIN TN Gallatin h	1560 WPAD KY Paducah h
1020 KDKA PA Pittsburgh k	1560 WQXR NY New York k
1030 KHOG AR Farmington \$	1580 KDAY CA Santa Monica h
1030 WBZ MA Boston k	1580 KLOU LA Lake Charles h
1050 WGAY MD Silver Spring h	1590 KYOU TX Houston k
1060 WNOE LA New Orleans h	

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A REVIEW OF THE SONY AM-STEREO RECEIVER
MODEL SRF-A100
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Recently my wife gave me one of those new Sony AM-Stereo receivers as a combination birthday and Hannukah present. I had been talking for some time about getting one. Unfortunately she could not make it a total surprise as she had to ask me for the model number so she'd know exactly what to get me.

I got the receiver on 6 DEC 83, my birthday. Since that time I had had time to use it and can now give my review on this new Sony AM-Stereo receiver and give my honest opinion of AM-Stereo.

The Sony AM-Stereo receiver is very small and compact. However do not let the small size fool you. This little receiver can really put out a lot of very good sound. Just try connecting it to a larger amplifier via a cord from the plug provided on the receiver; be sure to use a stereo cord. I did just that with mine the day after I got it and was really amazed at how good the sound was. Good quality sound is not the only thing that this receiver can give. It does real good at receiving all types of AM-Stereo broadcasts. The only drawback is that it will not receive the Kahn-Hazeltine system of AM-Stereo in the same manner as it receives all other types of stereo broadcasts. There is a slide switch provided on the left side to which you must place in either position "A" or position "B". Position "A" is used for the Harris, Magnavox and Motorola systems while position "B" is used for the Kahn-Hazeltine system. The only way to tell if you are not sure which system the particular station is using is by the quality of the AM-Stereo signal. There is no stereo indicator to tell you when you are receiving an AM-Stereo signal. The receiver does have a tuning indicator that shows when the station has been properly tuned in.

You would think that a receiver capable of receiving AM-Stereo would be a poor receiver when it comes to sensitivity and selectivity. This is not so with the Sony AM-Stereo receiver. There are two slide switches provided on the top. One adjusts the bandwidth for normal reception and for stereo reception, the other changes between the normal monaural AM mode, the AM-Stereo mode and FM-Stereo; yes, it also receives FM-Stereo. No FM SCA mode. This DX'er may soon remedy that. A look inside shows that there may be sufficient space to put another small circuit board to decode FM SCA signals. I enjoy hearing those exotic signals the FCC doesn't want you to hear. By putting the bandwidth selector switch in the normal position the receiver becomes more sensitive and selective. It also helps to tune in the station regardless of whether it is AM-Stereo by using the normal bandwidth position with the mode selector set to monaural AM reception. If you want to find if you are tuned to an AM-Stereo station you can then set the bandwidth switch to the wide position and the band selector to the AM-Stereo position. If you are tuned to AM-Stereo you should hear a stereo signal when the system you are tuned to corresponds with the position set by the stereo type selector switch on the side.

Other features include a tone control, separate on/off switch, AC-power plug (no AC-power cord is provided but is available from Sony or from your local dealer) and a carry strap which can be used in several positions. The receiver of course has two speakers for true stereo by itself or with another external amplifier via the plug provided on the side which can also double as an earphone jack. Infact an earphone jack is what it marked as.

The Sony AM-Stereo Receiver (Model SRF-A100) is a good receiver for the DX'er who likes to hear those new AM-Stereo signals. It can also be a good buy as a small compact FM DX receiver.