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Sound Conduits: Displaying the Architecture of Telecommunications

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¶1 *Planning for Home Telephone Conveniences*, AT&T, 1928.

The inventions of the telegraph, the telephone, radio — even the phonograph — are usually associated with ingenious figures and powerful tales that emphasize how those machines suddenly changed both our perception of sound and the very way in which we hear. “Mr. Watson, come here. I want to see you!” said Alexander Graham Bell to his assistant in 1876, through the first telephone connection. Thomas Edison heard his own voice

reciting a popular nursery rhyme — “Mary had a little lamb” — returning to him from the cylinder of the first ever phonograph, built in 1878. “Are you ready?” was, for its part, the first wireless message transmitted in Morse code by Guglielmo Marconi in 1897. That very same year, the inventor and entrepreneur founded his own company. Social and cultural revolutions — we are told — are related, then, to specific turning points that allow sound to lose a little bit of its ephemeral character and take people into the past or across long

distances. As Jonathan Sterne points out, these are powerful stories, because, by fixing a moment and by building a sort of myth, they tell us that something happened to the nature of sound during the late nineteenth century.¹ However, these tales are also historically incomplete since they tend to obliterate the practices, technologies, and ideas that emerged prior to these inventions. In our collective imaginary, sound reproduction technologies, such as the telephone and radio, are closely related to the invention of the ultimate device, the receiver or sound machine that allows a whole electric or electromagnetic system to operate. Yet it is useful to move beyond such devices and take another, broader perspective. The purpose of this study is therefore to focus on the conduits that power telephone and

PLANNING FOR HOME TELEPHONE CONVENIENCES

13. **Telephone Cabinets.** An alternative arrangement is to place the telephones in built-in cabinets such as illustrated in Figures 18, 19 and 20. In these cabinets the telephone bell box is concealed in the lower part which must be provided with a grill so that the bell will be heard when it rings. Conduit is run from the protector cabinet to the bottom of the telephone cabinet. Conduit also runs from the cabinet to the locations for the other telephones.



Figure 18.

[26]

1 Jonathan Sterne, *The Audible Past* (Durnham: Duke University Press, 2003), pp. 1–2.

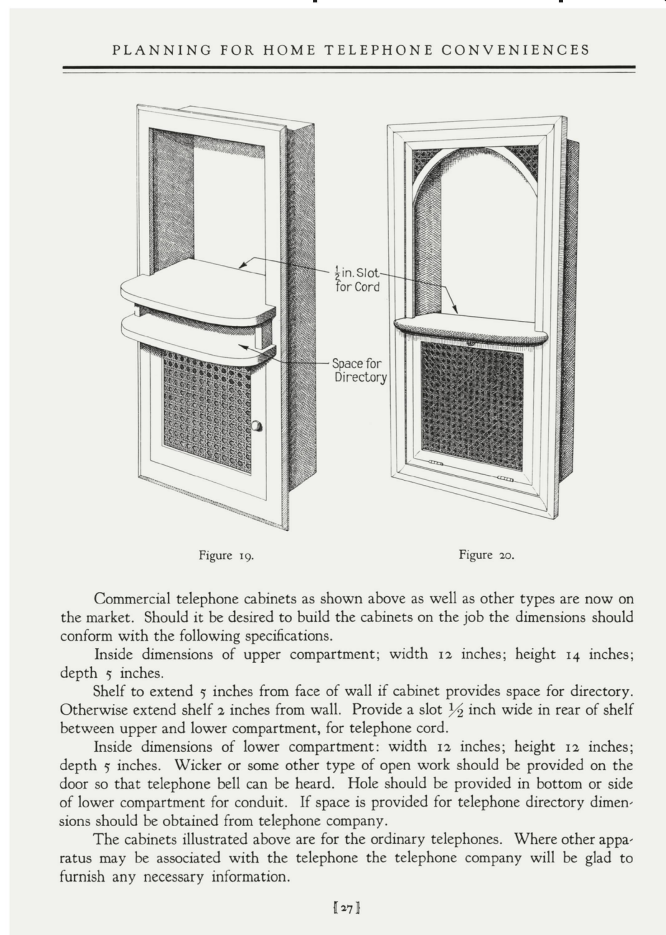
radio systems, as well as on how these became a part of architectural practice through their integration in planning processes. To this end, the material considered remains within a small scale, that is to say, the home or even the apartment. In addition, attention is paid here to original documents produced by American telecommunications companies at the height of their popularity, from the late 1920s to the 1940s, specifically to appeal to architects, engineers, and consumers.

A 1928 American Telephone and Telegraph Company (AT&T) booklet, *Planning for Home Telephone Conveniences*, illustrates the growing popularity of telephone services and their ongoing installation in American homes, which increasingly required the development of innovative design strategies from the range of people — owners, architects, engineers, and builders — involved in the construction process: "The placing of facilities for telephone

wires and apparatus during construction results in general improvement of the residence in that better appearance is secured by concealing the wires and some of the apparatus." ² A new science of planning emerged to address the integration of concealed or visible telephone facilities and apparatuses that were conceived either for immediate or future installation. "Conduits, protector cabinets, telephone cabinets, or other arrangements for concealing the wires and apparatus," the booklet says, "must necessarily become a permanent part

f.2 *Planning for Home Telephone Conveniences*, AT&T, 1928.

2 *Planning for Home Telephone Conveniences: For the Use of Architects, Engineers, Builders, Owners* (American Telegraph and Telephone Company, 1928), p. 7.



of the building." ³ In other words, installing telecommunications services was now not just the business of technicians and engineers but also an architectural concern. The booklet goes on to enumerate technical and functional details through a multitude of examples. Telephone conduits, wires, cables, outlets, and plugs had to enter the domestic interior as discreetly as possible. Rigorously separated from the electrical wiring, telephone conduits usually entered buildings through the exterior walls,

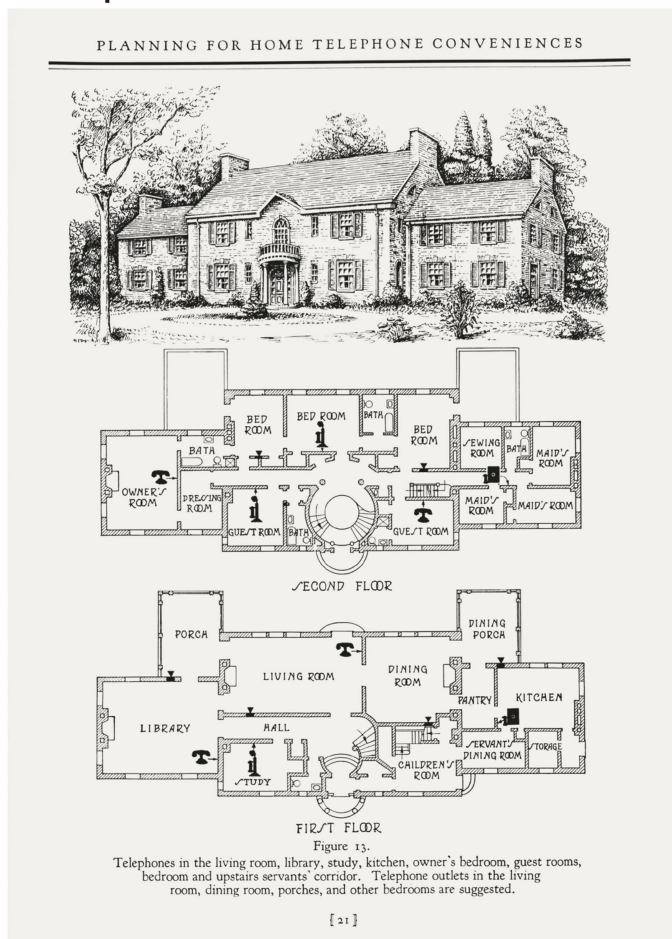
3 Ibid.

f.3 Planning for Home Telephone Conveniences, AT&T, 1928.

moving from the ground up, through the cellar ceiling or the first floor of the building. More rarely, they came in from above by passing through the attic. Telephones within domestic interiors were typically displayed on specially designed cabinets, or on already existing tables that comprised a built-in bell box cabinet, or they took the form of a wall-mounted handset telephone; and comfortable sofas and chairs accompanied them always, so as to foster the homely integration of this newly technologized practice of oral communication. f.1/f.2

The widespread infatuation with sound reproduction technologies resulted in a paradoxical need to display these emblems of modern acousmatic sound ("acousmatic" being the common designation of a sound that one hears without seeing its original source). 4 As the material manifestation of invisible communication, the aforementioned range of furnishings and designs came to frame and underline the existence of newfangled machines capable of reproducing a faraway, unseen, original sound. This distinction between seen and unseen objects, services, and infrastructures — taken as reflections of epitomic or limited functional means — becomes the focal point of the whole AT&T publication. Following the principle of North American kit house catalogs (the most popular of which was Sears' *Modern Homes*), the booklet shows a range of solutions for different homes, family configurations, and needs. From the single-family residence to the duplex or multi-unit apartment building, from the modernist to the vernacular or country-home style, the authors propose a specific installation of telephone facilities in order to obtain the most functional, comfortable, and efficient service. In addition to the visible system, that is to say the variously emphasized speaking and hearing points, the booklet displays plans for the attendant telephone conduit layout, the concealed side of a network f.3/f.4 — for even though hidden away, such conduits

4 On the definition and divulgation of the notion of acousmatic sound, see Pierre Schaeffer, *Traité des objets musicaux: Essai interdisciplines* (Paris: Éditions du Seuil, 1966), and Michel Chion, *Guide des objets sonores: Pierre Schaeffer et la recherche musicale* (Paris: Buchet-Chastel, 1983). For a critical investigation of the subject in terms of practices and culture, see Brian Kane, *Sound Unseen: Acousmatic Sound in Theory and Practice* (Oxford: Oxford University Press, 2014).



now become pivotal to the workings of the entire system and must therefore be accurately planned in advance. Furthermore, while telephones are somehow fixed and standardized objects, conduit layouts are the flexible part of the system; and crucially so, since they have to be adapted to specific needs and spatial configurations.

That same decade, AT&T published a second, less technical, and more captivating version of its guide to installing telephone facilities. This time, the booklet insisted on the explicit association with modernity and modern needs, addressing “the modern American,” and focusing on the “modern concept of comfortable living.”⁵ At the time, sound reproduction technologies represented the promise of science and rationality. They opened up new temporal patterns of communication in everyday life and were considered, in a word, modern.⁶ Indeed, visible

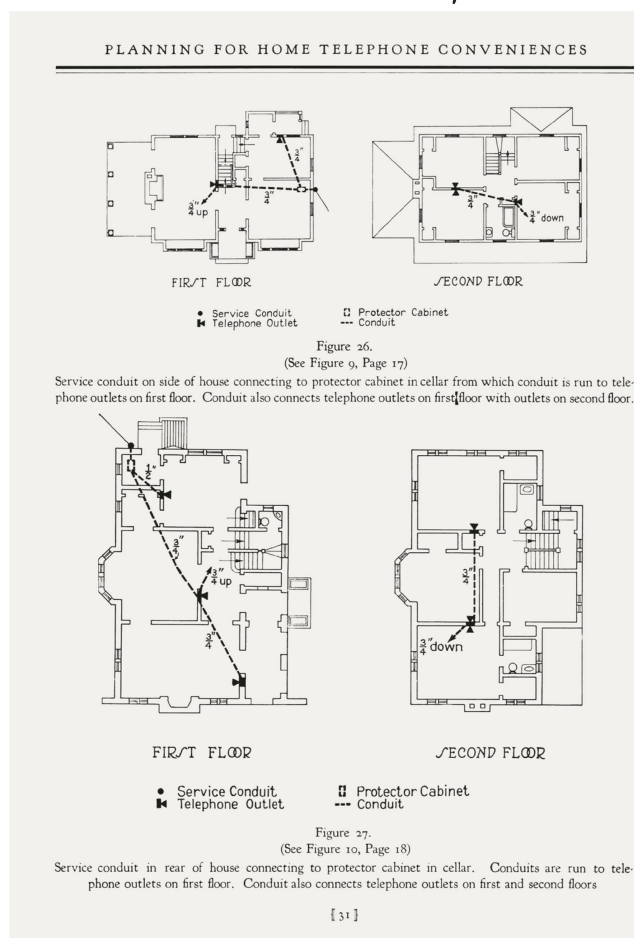
⁵ *Modern Telephone Service for the Home* (American Telegraph and Telephone Company, 1929), n.p.

⁶ Jonathan Sterne, “Sound Out of Time/Modernity’s Echo,” in Carol A. Stabile (ed.), *Turning the Century: Essays in Media and Cultural Studies* (Boulder, CO: Westview Press, 2000), pp. 9–30.

⁷ *Planning for Home Telephone Conveniences*, AT&T, 1928.

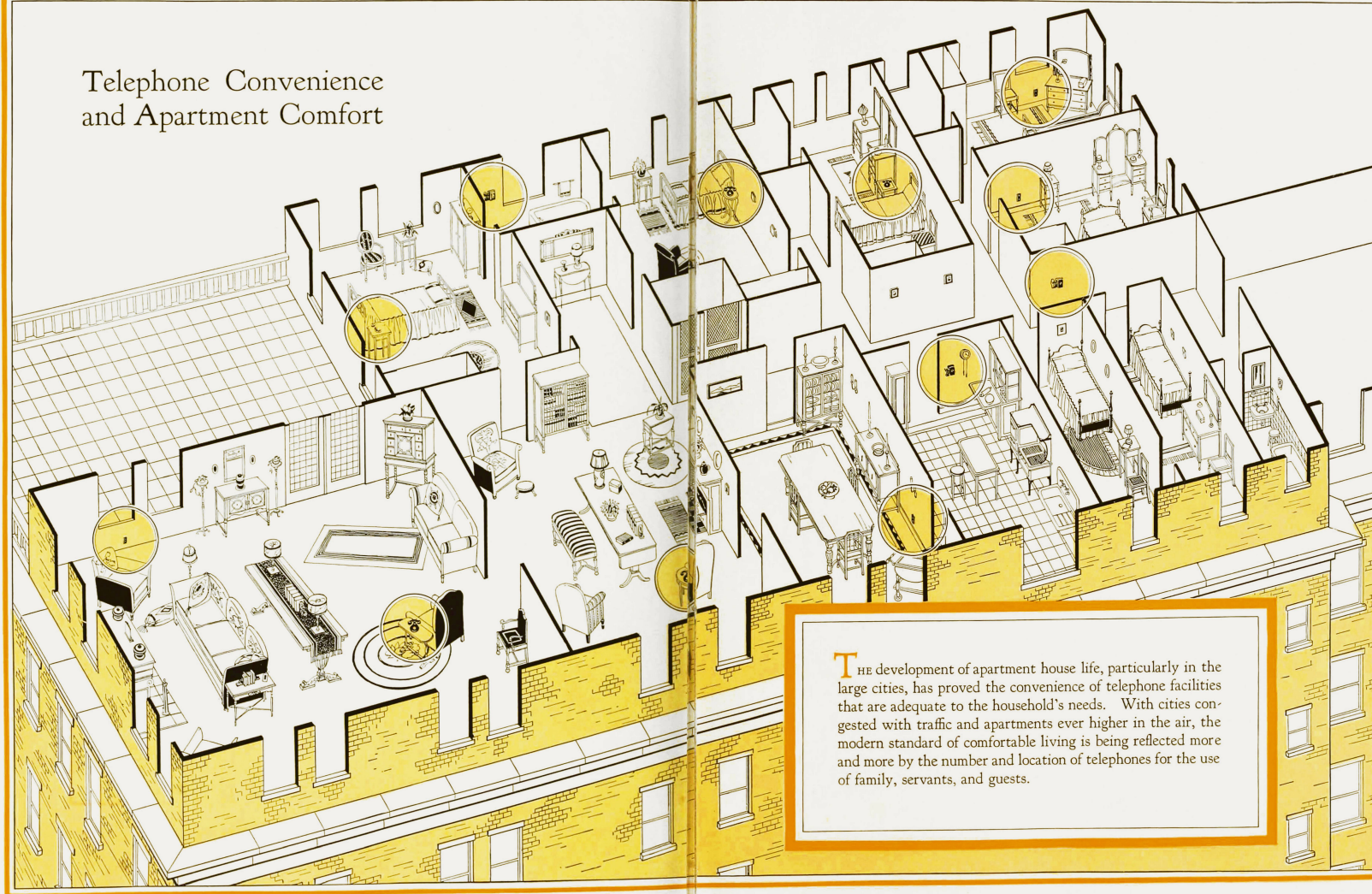
⁸ Adrian Forty, *Objects of Desire: Design & Society from Wedgwood to IBM* (New York: Pantheon Books, 1986). See in particular chapter 8 “Electricity—The Fuel of the Future,” pp. 182–206.

apparatuses such as telephones, radios, and the furniture that went with them embodied this relation to modernity. They became, as Adrian Forty would later put it, “objects of desire,” and their technical appearance an exciting emblem of progress.⁷ However, what is especially striking in this case is that, beyond the telephone itself, taken as an autonomous machine, the true object of desire seems to be the visible telephone system in its entirety, as inserted within various architectural situations. More than a mere technical manual, then,



this second version of the booklet reveals itself to be a propagandistic document that introduces the aesthetic dimension of telecommunications facilities. “Such permanent built-in features have the double advantage of being both useful and decorative.”⁸ Once again, the authors insist on the adaptability of the service to different styles of housing, from the very modest one-story bungalow to the elaborate residence that is best served “by a complete intercommunicating service in addition to

Telephone Convenience and Apartment Comfort



THE development of apartment house life, particularly in the large cities, has proved the convenience of telephone facilities that are adequate to the household's needs. With cities congested with traffic and apartments ever higher in the air, the modern standard of comfortable living is being reflected more and more by the number and location of telephones for the use of family, servants, and guests.

9 Ibid.

10 Ibid.

f.6 *Modern Telephone Service for the Home*, AT&T, 1920s.

11 Ibid.

12 Ibid.

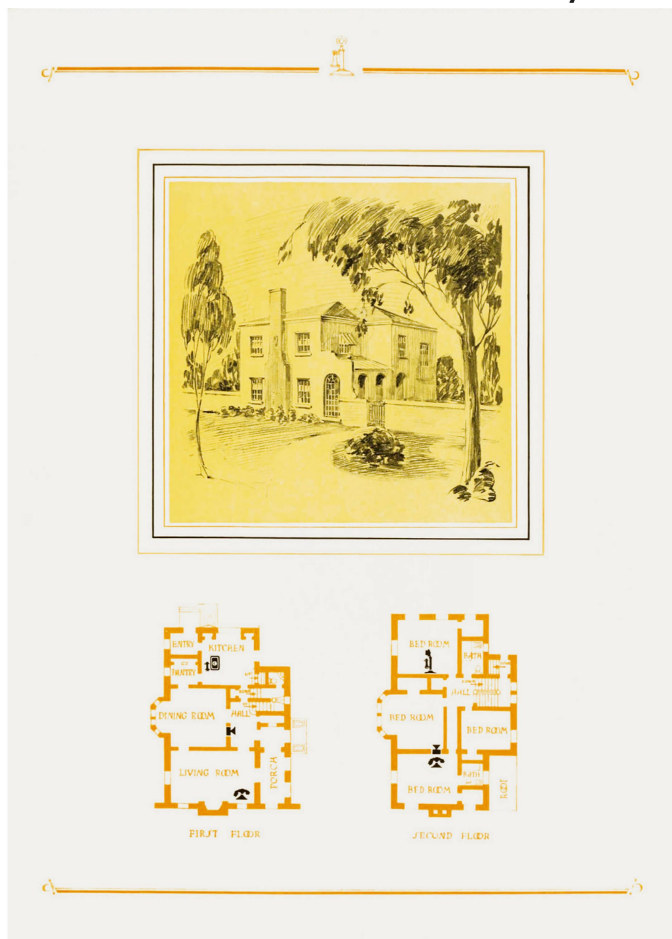
13 *Home Telephone Conveniences* (see note 2), p. 29.

the ordinary facilities.”⁹ The same series of plans related to various typologies of home is displayed by way of example: “A few typical floor plans will illustrate the way in which the modern American idea of comfort and convenience is being adapted to homes of many styles,” the document states.^{10/f.6/f.7} Beauty must

be combined with convenience by planning the appropriate setting for telephones and choosing the kind of apparatus that corresponds to the respective home interior. “Tables, stands, and cabinets,” it continues, “are available in an almost infinite diversity of styles and finishes. They may be had in choice woods of various colors and grains to harmonize with any scheme of home decoration.”¹¹ A striking axonometric view of the floor of a generic apartment building shows the disposition of visible telephone apparatuses and outlets according to the household’s needs and contemporaneous notions of comfort.

“With cities congested with traffic and apartments ever higher in the air, the modern standard of comfortable living is being reflected more and more by the number and location of telephones for the use of the family, servants, and guests.”^{12/f.5}

Looking at the material culture surrounding telecommunications at the time, it becomes clear that this mode of representation — the axonometric view — is recurrent, probably because it offered an effective way of displaying telecommunications facilities and their integration within architecture, in particular within architectural planning. Another, more synthetic booklet for telephone installation presents an axonometric view of two empty generic homes — a small or medium-sized one, and a larger one — which are both equipped with what the booklet calls “typical telephone conduit layouts”.^{13/f.8/f.9} Again, the authors’ ultimate message is that, in order to buy or build a modern home, one needs to anticipate the installation of telephone conduits



during the planning process. These stylized versions of axonometric views, bare of interior furniture and other domestic equipment, further emphasize the essential need to couple telephone facilities with primary elements of construction such as walls, floors, and the roof.

As Yve-Alain Bois and previously Bruno Reichlin observed, axonometry is a mode of representation that became widespread during the modern period.¹⁴ Prior to that time, and since the Renaissance period, the illusionistic perspective posited by Alberti and Piero della Francesca had been the privileged

¹⁴ See Yve-Alain Bois, "Metamorphosis of Axonometry," *Daidalos*, 1 (1981), pp. 40–58, and Bruno Reichlin, "The Axonometric as a Project: A Study of Alberto Sartoris," *Lotus International*, 22 (1979), pp. 83–93.

¹⁵ On the cultural use of axonometry throughout Western history, see Massimo Scolari, *Il disegno obliquo: una storia dell'antiprospectiva* (Venice: Marsilio Editori, 2005). In particular, see the chapter "Disegnare in paralleli modo," pp. 284–93.

^{f.7} *Modern Telephone Service for the Home*, AT&T, 1920s.



mode of representation, reflecting cultural models of the epoch.¹⁵ Perspective focuses on the observer's perception of an object from a given spatial position, whereas axonometry preserves in scale the given object's actual dimensions, independently of its spatial location. Since the Middle Ages, axonometric projection had been used for technical drawings and deployed in the construction of fortifications and machines, whenever detail, precision, and the workings of the objects concerned was a primary practical necessity.¹⁶ From

the early twentieth century onwards, the use of axonometry became more widespread, extending way beyond the specialized, technical fields.

The meaning of this change is threefold. Firstly, this mode of representation turns out to be the expression of a new functionalist regime that prompts a major cultural shift, from a conception of architecture as a static and formalized object to one that calls attention to its performative and mechanized processes. Secondly, unlike the classical perspective, which limits the observer to a single viewpoint situated outside the building itself, the axonometric view allows observers to enter the volume in order to gain a thorough picture of it. And lastly, from that inner point of view, the user becomes a sort of ubiquitous figure,

¹⁶ See chapters "Machinationes" and "La prospettiva soldatesca," in *ibid.*, pp. 229–84.

17 See Yve-Alain Bois, "Montage and Architecture," *Assemblage*, 10 (1989), pp. 111–15, in particular on Auguste Choisy's cinematic use of axonometry.

f.8 Advertising brochure for AT&T, date unknown.

potentially able to live (and communicate) in every part of a house, from the bathroom to the living room, and so on. In providing not a single, central viewpoint but an ensemble of equitable views, axonometry suggests a temporal movement through a building's various interiors and produces thus a "cinematic" perception of architecture.¹⁷ Modern architects seeking to destroy the traditional supremacy of the façade that was inherent to classicism found in axonometry a suitable way to represent their buildings from multiple perspectives, and to draw attention to the spatial and structural features of their work. Due to its ability

YOUR NEW HOME IS MORE MODERN
with telephone conduit



GAME ROOM—
A telephone conduit outlet in a basement game room or a first floor den provides telephone convenience when you want it there, with no exposed wiring.



KITCHEN—
A hang-up telephone. Useful in the big job of running the household. Can be neatly installed despite tiled walls—if telephone conduit (pipe) and an outlet have been provided.



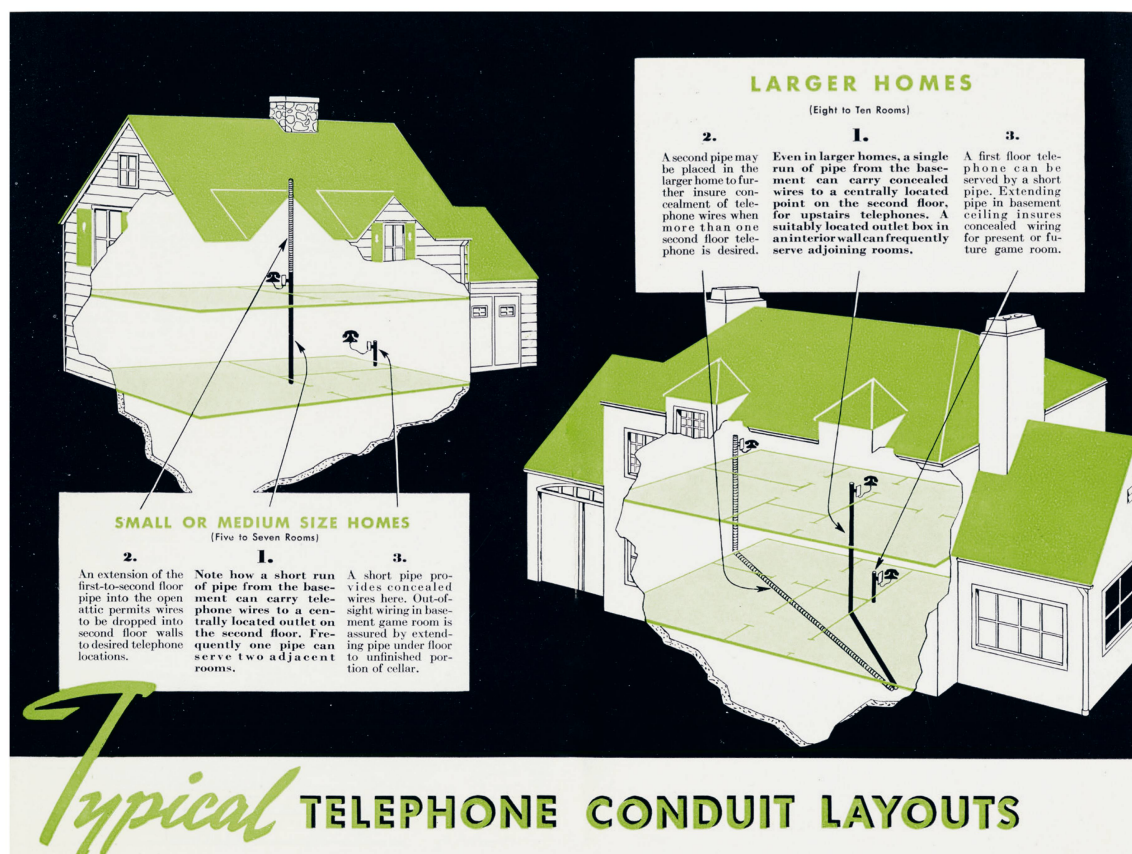
BEDROOMS or GUESTROOM—
For your guest, an expression of hospitality. For yourself — saves running downstairs to telephone. A reassuring link with the outside world at night.

WHY BUILT-IN TELEPHONE CONDUIT SHOULD BE IN YOUR NEW HOME

WHETHER you build for your own immediate needs and convenience . . . or for enlarged needs as years go by . . . or with the idea of selling the home . . . built-in telephone conduit, which is installed at negligible cost when the house is under construction, will help insure the maximum of convenience for yourself as long as you use the home, and will provide an added selling feature when the time comes for buyers to consider it. Ask your telephone business office about it.

to represent the third dimension of architecture, axonometry also facilitates the display of different layers or phases of construction. Compared to a fixed and finished perspective, it tells the observer more about the planning process by revealing, for instance, the presence of conduits buried deep within a structure's walls and the different technical apparatuses that occupy architectural interiors. Thus, this mode of representation makes visible modern architects' interest in technology since it reveals the functioning of buildings, positing them as whole, spatially and technically unified systems.

Another telecommunications document from the George Clark Radioana Collection (at the Smithsonian Institution) shows the ensemble of conduits powering an array of radio devices distributed throughout each room of the home, with the exception of the stairs, by way of a perspective sectional drawing. f.10 Electrical



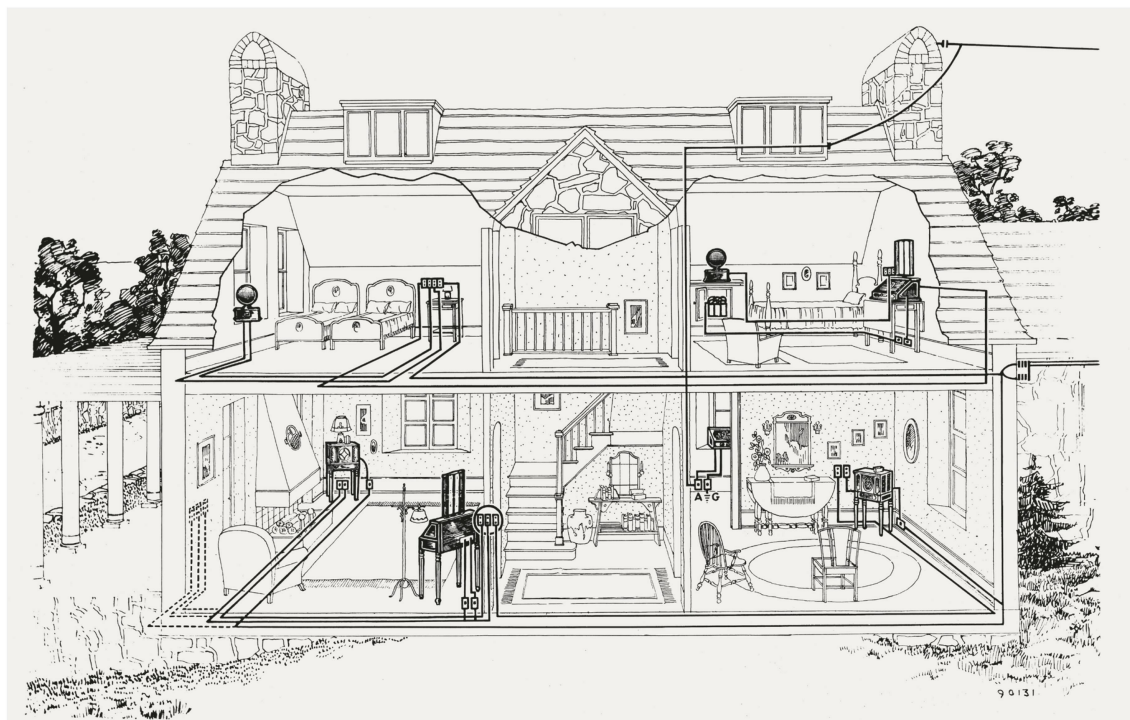
conduits, concealed within the walls and floors, enable different kinds of equipment to produce sounds and music addressed to a new type of domestic audience. As a typical product of the culture of the nineteenth century, this kind of analytical section displays the “interior as a façade,” thereby coupling the classical perspective that keeps the observer at a distance, outside, with the modernist need to represent technical services hidden within the architecture.¹⁸ In thus highlighting by means of graphic representation that latter tension between architecture and technics, and architecture and construction, the document serves not only to corroborate a progressive interest in architectural representation on the part of telecommunications propaganda but also incisively illustrates a gradual transition to modernity.¹⁹

To conclude, then, from the late 1920s onwards, documents from telecommunications companies seemed to borrow directly from the architectural culture of the epoch. The broad use of plans and axonometries in advertising materials attests both the intent to address professionals in a direct manner and the endeavor to make the technical language of architecture available to the general public. f.11/f.12/f.13/f.14 Like technology, technics—or rather, the art of fabricating things—was now no longer something to be hidden, but an exciting marker of progress, something that must be put on display, emphasized, and even aestheticized. Instead of calling attention to the latest sound reproduction technology—the telephone in this case—this series of images highlights that

¹⁸ Georges Teyssot, “A Topology of Thresholds,” in *Home Culture*, 2, no. 1 (2005), pp. 89–116.

¹⁹ Antoine Picon, “Du traité à la revue, l’image d’architecture au siècle de l’industrie,” in Stéphane Michaud, Jean-Yves Mollier, and Nicole Savy (eds.), *Usage de l’image au XIXe siècle* (Paris: Créaphis, 1992), pp. 153–65.

f.10 Drawing from the George H. Clark Radioana Collection, date unknown.



f.11 Advert for AT&T, 1947.



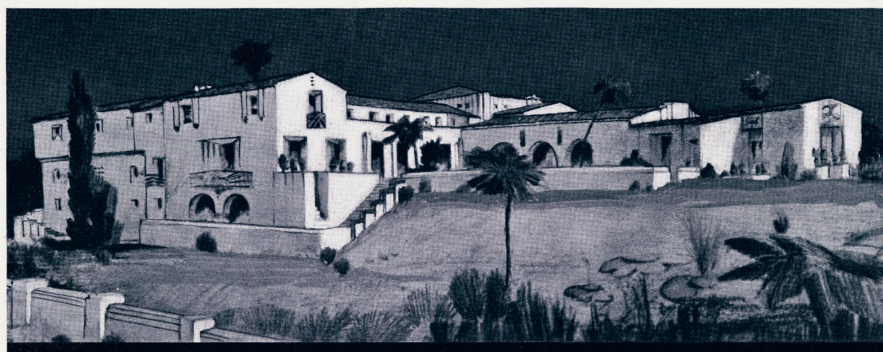
20 Bruno Latour, "How to Be Iconophilic in Art, Science and Religion?" in Carrie A. Jones and Peter Gallison (eds.), *Picturing Science, Producing Art* (London: Routledge, 1998), pp. 418–40.

telephone conduits were planned directly alongside architecture; and it places a particular emphasis on the articulate organization of these conduits — and of the corresponding aspects of domestic life — as rendered in architectural plans or axonometrical views. Generally speaking, drawings function as mediators of architecture since they convey select information about an actual object. In selecting a specific graphic language, one chooses which particular content must be maintained during the transition from architecture itself (the object) to its mediator (the drawing).²⁰ Thus, the ensemble of documents produced as part of telecommunications propaganda materials must be seen as a typical expression of the agenda of the so-called machine age, one which voluntarily stresses the technicality of things.

From among the variety of interpretations of modernity to be noted at the time, two diametrically opposed positions

C. D.
Record Book
To Present
JUN 5 1931

Built-in conduit and nineteen outlets provide for telephone convenience in this residence at 282 South Mapleton Drive, Holmby Hills, Los Angeles, Cal. NATIONAL THRIFT CORPORATION OF AMERICA, Builder. L. G. SCHERER, Architect, Los Angeles.



"NINETEEN OUTLETS FOR CONVENIENT TELEPHONE SERVICE"

BUILT-IN telephone convenience makes homes more salable, more livable, whether they're small or large. In the latter class is the residence pictured on this page. Its builders say:

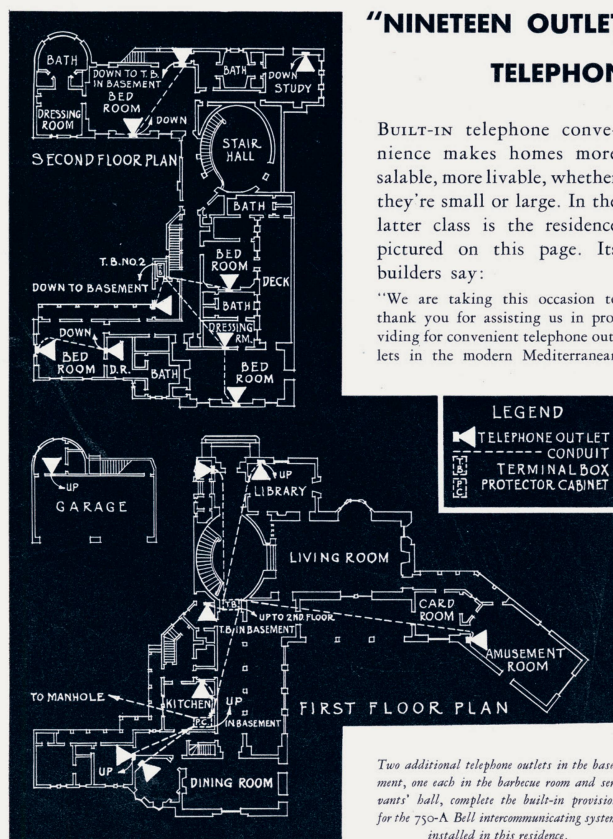
"We are taking this occasion to thank you for assisting us in providing for convenient telephone outlets in the modern Mediterranean

residence we are constructing in Holmby Hills, Los Angeles, Calif.

"We have provided nineteen outlets for convenient telephone service throughout the building and all wiring will be concealed in the walls and floors. The bell boxes will be recessed at all points.

"The conduit has been installed as outlined in your specification and terminates at a point in the basement where sufficient space has been provided to accommodate the necessary mechanical equipment to operate the dial system."

Telephone conduit, built-in during construction, permits outlets to be located wherever they're wanted, improves appearance by concealing wiring, and protects against most kinds of service interruptions. It is easily and economically provided for by planning in advance. The local telephone company will help you gladly, without charge. Just call the Business Office.



Two additional telephone outlets in the basement, one each in the barbecue room and servants' hall, complete the built-in provision for the 750-A Bell intercommunicating system installed in this residence.



32275-7x10

Conv. Builders November

PROOF FROM
N. W. AYER & SON, INCORPORATED
ADVERTISING HEADQUARTERS, PHILADELPHIA

21 Philip Johnson and Alfred H. Barr Jr., *Machine Art* (New York: The Museum of Modern Art, 1934), p. 3.

f.13 Advert for AT&T, 1947.

22 Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace & World, 1963 [1934]), p. 12.

emerged in regard to machines. On the one hand, the sublimation of finished and geometrical objects as plastic products with inherent symbolic values. This is a formal position that is given full expression, for instance, in the 1934 Machine Art exhibition at MoMA. In his introduction to the catalog, Philip Johnson states that the "beauty of machine art is in part the abstract beauty of 'straight lines and circles' made into actual tangible 'surfaces and solids' by means of tools, 'lathes and rulers and squares.' ... Machines are, visually speaking, a practical application of geometry." 21 This geometric infatuation led him, along with Alfred H.

Barr Jr., to curate an exhibition on modern design that combined tools with machines, from the spoon to the microscope, without making any proper distinction between them and without questioning how they functioned. On the other hand, the operative behavior of the machine is central to the emergence of a more processual viewpoint. This position is well represented by another modern thinker: indeed, the very same year as the MoMA exhibition, Lewis Mumford published *Technics and Civilization*, wherein he defined the machine as "the ensemble of knowledge

and skills and arts implicated in the new technics." 22 The degree of a machine's independence from its operator — its automatic nature — and the degree of specialization within its functions are, according to Mumford, the constituents of the fundamental difference between a machine and a tool.

These two positions can quite easily be set into a direct dialogue with the contemporary material culture of telecommunication. The first understanding then relates to representations that rhetorically as well as visually place the sounding end device — the telephone, the radio, etc. — at center stage. The latter definition, which insists on the automation of functions and the specialization of processes, in contrast relates to representations that



emphasize the underlying technical systems and the spatial and temporal relations and practices involved—just as the specific corpus of documents taken from telecommunications companies' propaganda materials and described above does. In this sense, I would suggest that these representations of conduits

within architectural interiors offered a machinic reading of telecommunications and, accordingly, of architecture as well. More than singular sound reproduction technologies and isolated objects, the systems of sound conduits ultimately reveal the processes and workings of a new era of domestic communication technologies.

f.14 Advert for AT&T, 1938/39.

C. D.
Record Book
11/18/38

Suppose we want an upstairs telephone some day?



Many specifications today provide the perfect answer to that "client's question": built-in conduit to locations for both present and possible future telephones. Such provision for the future is good business and will impress your clients—and good practice, too, for conduit is the one way to overcome the complications created by many of today's building methods.

Wall insulation, firestops, ductwork and concrete effectively prohibit "fishing" wires through finished walls and floors. But conduit, built in during construction, is always ready to carry wiring through. This means that extra telephones may be added without exposed wiring, without piercing walls and floors.

Built-in telephone conduit costs little. One or two lengths of small pipe are enough for the average small house. Call the telephone company's "Architects' Service" for suggestions in planning conduit layouts. No charge.



**PLAN TODAY
FOR
TOMORROW'S
TELEPHONES**

No. P-4225-1929 7x10 8401

One-page - Pencil Points - February, 1939
Architectural Record - January, 1939
Architectural Forum - February, 1939

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