

Trimming Out the Main House

Building a Victorian headquarters for George Lucas

by Rick Wachs

In a rural valley just north of San Francisco, a working ranch is being developed. In this grassy, rolling countryside, dairies are common. But on this ranch, the old milking shed is where power tools and air compressors are repaired. Next to it, a new 15,000-sq. ft. barn houses a mill shop outfitted with the best woodworking tools that money can buy and staffed by some of the most talented woodworkers on the West Coast. Their job is to produce parts for the various buildings that will be a complete pre-production and post-production filmmaking complex for Lucasfilm. The ranch will eventually have facilities for film editing and sound recording, as well as offices for the people who will maintain the complex. The buildings are arranged in small clusters across 2,600 acres of land, and each one is done in a turn-of-the-century style, such as Shingle or Queen Anne Victorian.

The jewel of the ranch is the Main House (photo facing page, top), and it stands at the upper end of a small valley. The Main House is a grand Victorian flagship of a building with 6,000 sq. ft. of covered porches, a turret, a tower, dormers, gables with fretwork panels, and numerous chimneys. One wing has raised elliptical panels above banks of casement sash. The tower with arch-top sash is decorated with starburst panels, corbels, dentils and built-up cornice moldings. Almost 2,000 ft. of ornate handrail encloses the porches. The house has almost 500 windows, many of which are double-hung sash with radiused glass.

The Main House covers 45,000 sq. ft. on four levels. It includes executive offices, a library, a screening room, a commercial kitchen, breakfast, dining, conference and living rooms, ancillary offices and editing workrooms, not to mention all the bathrooms, coffee kitchens, mechanical and electrical service rooms, and an elevator. There are also 13 fireplaces and a 12,000-amp service panel.

The interior of the house overflows with exquisite woodwork. One cannot help but be awed by the luxuriant atmosphere. The construction took three years. Twenty-five finish carpenters, myself among them, worked on the house at the peak of the project.

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Background—Because of the highly specialized functions of many rooms and because it was built to commercial code in earthquake country, the house embodies unusual structural, mechanical and electrical systems.

The framing is of 2x6s and 3x6s with tubular steel posts, K-braces, wide-flange beams and glue-laminated beams. Within the walls and floors are conduits carrying fiber optics, computer, telephone, security, stereo, heat and smoke-detection systems, fire sprinklers and HVAC ducting, in addition to plumbing and electrical systems. Because Lucasfilm uses the

most advanced technologies, we even installed runs of empty conduit for linking electrical systems that haven't yet been invented. All walls have at least two layers of $\frac{5}{8}$ -in. gypsum board on each side, some as many as four.

Review and modification were common, as were frequent visits from the client. Collaboration was constant among the many designers, architects, millworkers and carpenters, all of whom were based on site. Given the client's substantial resources and his involvement in the visual arts, the design team was asked to do drawings on a scale reminiscent of those done in the days of the Ecole des Beaux-Arts. The massive roll of blueprints that stretched across my desk included 30-in. by 40-in. pages with drawings at $\frac{1}{2}$ in. to a foot showing every piece of trim on a wall 25 ft. high. Drawings of this intricacy were done for all the details in the building, and set the tone for the millworkers and trim carpenters who had to turn them into reality. There are not many buildings going up these days with $7\frac{1}{2}$ -in. wide Victorian casing, radiused to boot. All the carpenters had to develop and perfect skills they had seldom used. Patience and a thoughtful approach were essential.

Crown moldings and balconies curve around the room as wainscot and stairway ascend toward the 20-ft. ceiling in the Main House lobby. These embellishments are in the formal style, one of three major trim styles used in the building. Every wooden element in the room, from the inlaid flooring to the compound curved handrails and wainscot panels, was made in the mill shop on site.

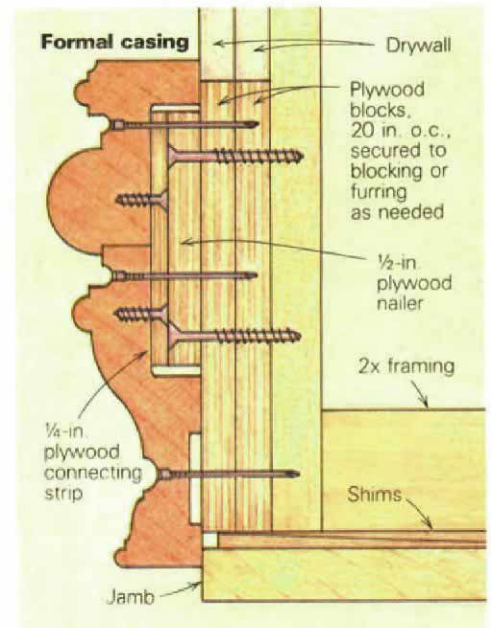


Redwood trim stock—Originally the house was to be trimmed entirely of oak, but plans changed when we found a local source of salvaged redwood timbers from first-growth trees. The beams, which were 6x16s, 20 ft. long, had been part of a bridge across the Newport Beach estuary in Southern California. The availability of the clear-heart redwood, which is a lot easier to work than oak, was the deciding factor.

For the Main House trim, we purchased 200,000 board feet of redwood in beams. The deep bluish-red color and tight vertical grain is unequalled in lumber currently available. Upon their arrival at the ranch, the beams were inspected and stacked. Those with vertical grain on the 16-in. face were marked as such, and set aside for door and wainscot panels. The re-



At the heart of Skywalker Ranch is the Main House. Since his early days as a film student at the University of Southern California, George Lucas has valued the steadying influence of working in a homelike atmosphere. He is now carrying out that principle on a grand scale—after three years of construction, this 45,000-sq. ft. Victorian Revival mansion is about to become headquarters for Lucas' pre-production and post-production filmmaking facilities.



To anchor the formal casings, plywood blocks, seen on the right edge of the door in the photo below, were screwed to the stud wall and the drywall was notched around them. A 1/2-in. plywood nailer was then screwed to the blocks to provide solid backing for the 7 1/2-in. wide door casings, as shown in the drawing at right.



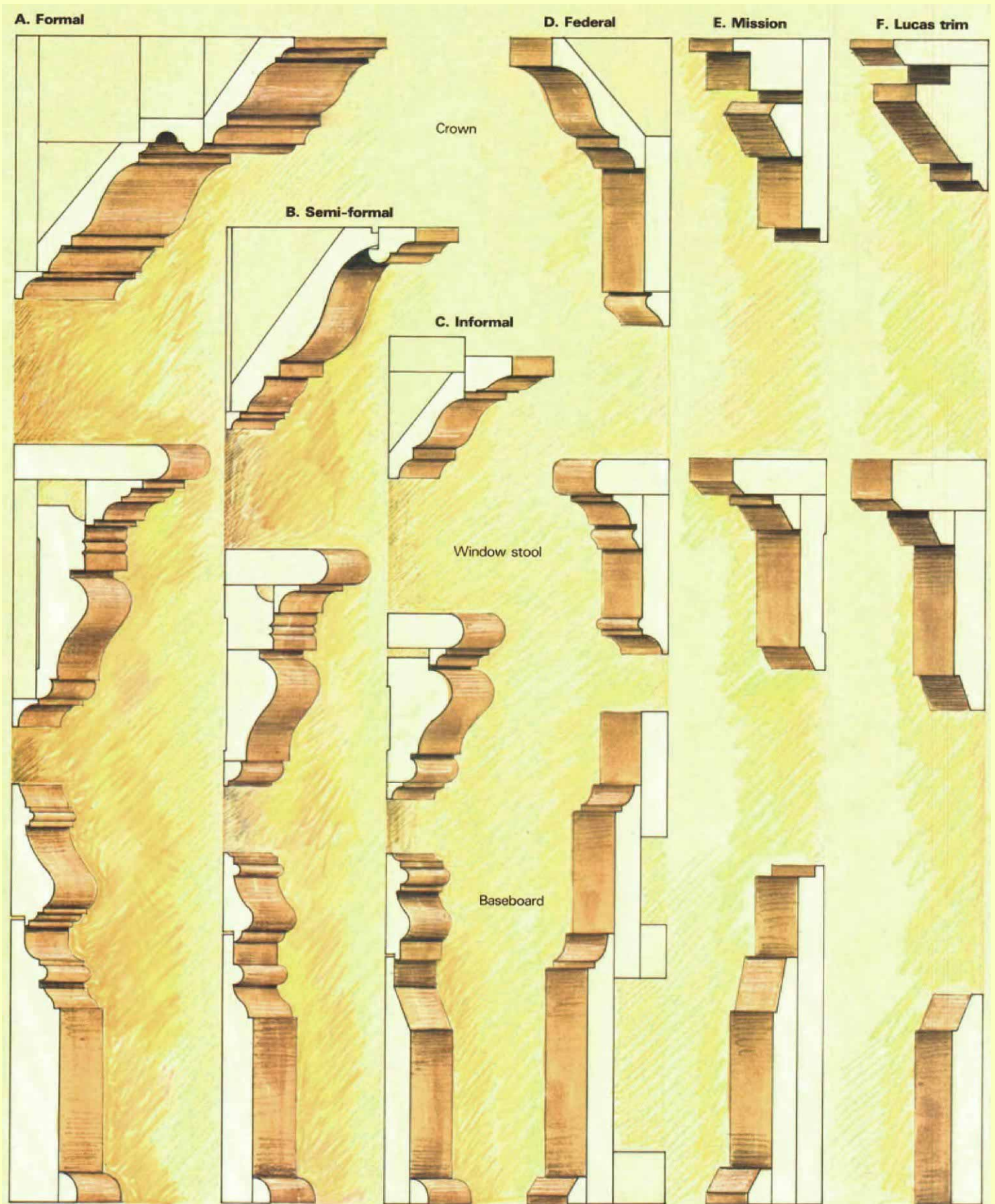
Formal crown molding was designed to split into two separate crowns where it makes its turn into the lobby. At top, the radiused crown awaits a butt-joined section of straight crown to tie it into the turned drum. Note the blocks screwed to the wall to secure the crown. The finished installation (above) shows how the various trim elements come together, a major exercise in scribe-fitting where the crowns meet the drum.



Skywalker trim styles

Moldings and casings in the Main House range from the sumptuously ornate in the most public rooms to simple and serviceable in the more private workrooms deep within the building. The most elaborate trims are the formal and the Federal, followed by the Mission styles used in the library and screening room. A variation on the Mission style is Lucas trim, used in the filmmaker's

writing room. Falling between the ornate and the strictly utilitarian are the semi-formal and informal offshoots of the formal style. These are used in public rooms, such as the breakfast room, enclosed porches and coffee kitchens. Below are drawings of the most frequently used trims in the house, showing sections of crowns, window stools and baseboards.





Lucas' writing room is detailed in Lucas trim, a style reminiscent of Mission and Arts and Crafts motifs, with wide bevels and crisp chamfers. The gap in the crown molding is both a revealed shadow line and, in places, a duct for the cold-air return. The brass lamps were made by a Skywalker company set up solely to manufacture lighting fixtures for the Ranch.



The conference room of the Main House is done in Federal-style trim, which is characterized by stepped-out baseboards and fluted casings. The wainscot panels that surround the fireplace are redwood burl, framed by strips of ebony, Brazilian rosewood and brass. The hearth and fireplace surround are of green marble.

maining beams were resawn for door and window casings, crown and base, and a couple of hundred moldings with specialized profiles.

Trim styles—The principal trim styles in the house, which are shown in the drawing on the facing page, vary in degree of formality. The lobby (bottom right photo, p. 45), living room and music room are finished with the most ornate and massive trim in the house, which we called formal trim (A in the drawing). Throughout the house, transitions occur leading to semi-formal (B), informal (C) and Mission-style (E) areas. In some rooms Federal trim (D and photo above right) creates the mood.

Many of the hybrid trim styles draw from traditional patterns and were modified according to the ideas and fancy of the designers involved in the project. The best example may be what we called Lucas trim (F). Used solely in his writing room (photo above left), it has a chamfered, rectilinear look that recalls the Mission and Arts and Crafts periods.

During the design and development of the interior trim styles, we made full-scale mockups of all the major wall treatments. These were 4-ft. wide by 9-ft. high wall sections, built and finished to the exact specifications of each trim area. On the formal-trim mockup, the wainscot panels could be slid out and replaced by alternate designs. Lucas made his final decisions about the trim styles after he reviewed the mockups, and we often referred to them during construction. It was quite a sight to see a half-

dozen sections of immaculately detailed walls leaning against the wall of the conference room during these reviews.

Formal casing. Formal casing is 7½ in. wide and 2¼ in. thick at its highest point. In order to rough out the stock from the 6x16s economically and to ensure a clean run on the molding machine, formal casing was made in two parts. Once the material had been milled, our mill-shop foreman decided to modify it further. He realized that securing the large bead on the outer portion of the casing could require a 20d nail to reach the framing through two layers of gypsum board. The casing parts were plowed out to form a groove ¾ in. deep. This was to accommodate a ¼-in. thick plywood connecting strip and a ½-in. thick nailer (drawing, p. 45), which in turn could be secured to plywood blocks, eliminating the need for such large nails in the casing itself.

A carpenter with the task of mitering the formal casing would first join the two-piece casing with a ¼-in. strip of plywood, glue and screws. Then he would make the miter cut on a 16-in. power miter box and test-fit it with its neighboring piece. No matter how accurate the corresponding profile, small variations in the casings made it necessary to fit each joint meticulously. Chisels, gouges, files, and sandpaper of various grits were used to make the infinitesimal adjustments at the miters to ensure smooth transitions from adjoining casings.

Once the corners fit properly, ½-in. plywood nailers were screwed to the framing, and the

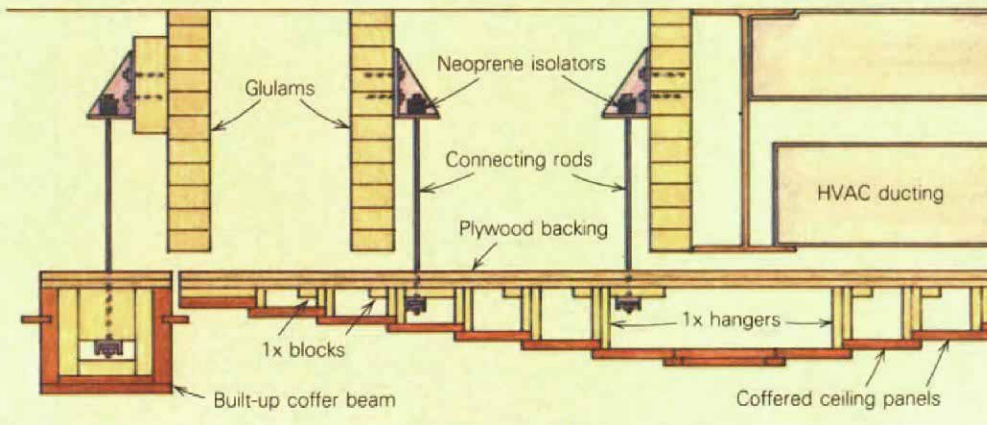
casings were glued and nailed to the jamb and the nailers. Formal plinths were made out of casing offcuts. Their outer edges were ripped off and replaced by deeper and wider moldings, which create a ⅛-in. reveal on top of the plinth.

Formal crown. Formal crown (drawing A, facing page) is built up from four moldings that are nailed to backing blocks designed to align and secure the trim. The area trimmed in this style contains twelve radiused outside corners and two radiused inside corners. The mill shop made all the radiused parts from the beam stock. Because of the jungle of conduit and ducting inside the walls and ceiling, backing wasn't always easy to find. To secure blocks for the crown, we first put ½-in. plywood strips up with glue and screws. The blocks were then glued and screwed to the plywood strips on 16-in. centers.

The formal crown molding in the lobby is made up of two equal halves, which allows it to divide and become two separate crowns at the balcony. At this intersection, the lower portion of the crown wraps around the radiused wall and dies into a turned drum (photos previous page, middle and bottom left).

Screening room—The screening room (photo next page) is finished with redwood boards milled from 18-ft. long barrel staves salvaged from wine vats. Years of marination intensified the wood's naturally reddish hue, and the acid in the wine left dark streaks in places. Whenever we sawed into the wood, the odor of wine filled

Screening-room ceiling



the room. It was as if fine chefs instead of carpenters were at work.

The screening room is sound-isolated from the rest of the building. On the slab floor of the basement we poured a second slab. It is 4 in. thick and contains jacks made of threaded rods inserted into sleeves at 24 in. o. c. throughout. After the slab had sufficiently cured, a crew armed with wrenches turned the jacks in unison to the call of the lead man. The slab now rests on a series of points.

We built 2x6 walls upon the floating slab, and then suspended the ceiling from the glulams in the floor above the room. Neoprene isolators keep the ceiling and the walls from making any direct contact with the rest of the building. At the doors and projection ports, rubber gaskets separate the wood surfaces. In this vibration-free room there is an eerie silence. I was standing in the screening room during the Morgan Hill earthquake in 1983, and didn't feel the slightest jiggle, though it was felt just outside the room and sharply on the upper floors.

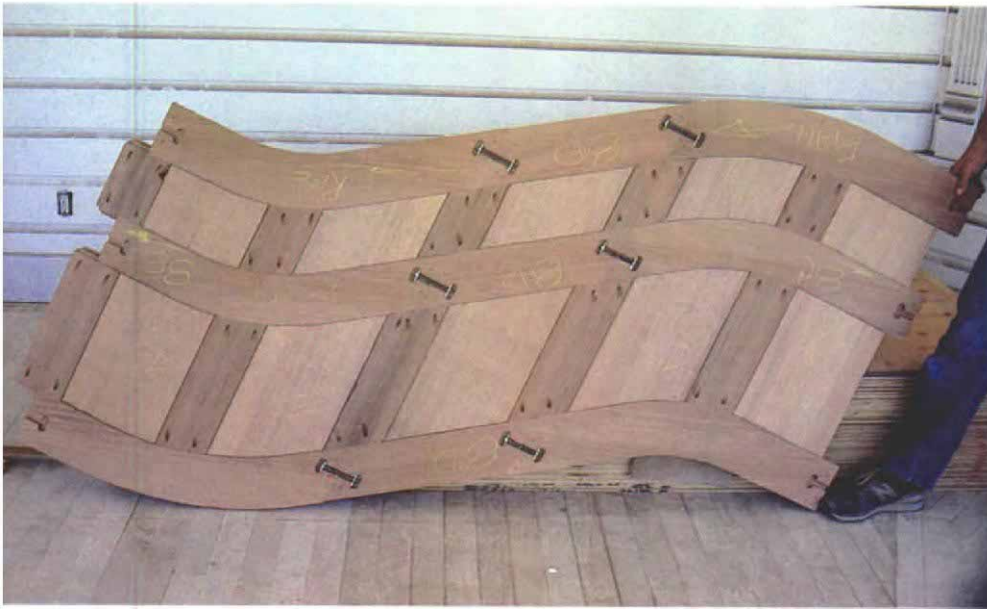
The trim material was sawn from the 3x6 staves in three layers. Boards from the first cut, closest to the inside of the barrel, were a deep red. The second and third cuts produced boards with less staining from the wine. In order to blend the three different colors in the room, the paint foreman used several red stains and Procion dye mixed with alcohol. With three coats of polyurethane finish, the woodwork glows.

The coffered ceiling in the screening room is attached to plywood hung from glulams. In each bay a series of 1x hangers on edge were glued and screwed to 1x blocks (drawing above left). Each of the wine-wood ceiling panels is finish-nailed to a pair of 1x hangers. The layout had to be precise because sprinkler heads are located at beam intersections and panel centers, lights are centered in smaller perimeter bays and the HVAC vents through slotted grilles around the center panel. Coved capitals join the pilasters to the coffer beams. They were made from band-sawn 1x sides with veneers forming the faces. Plywood was bandsawn to serve as backing for the 1x4 V-groove that fills out the cove between the capitals. The 1x4 paneling below the sill at the fabric panels is canted in at the base to limit sound reverberation across the room. Behind the fabric panels, perforated Masonite and insulation help absorb the sound.

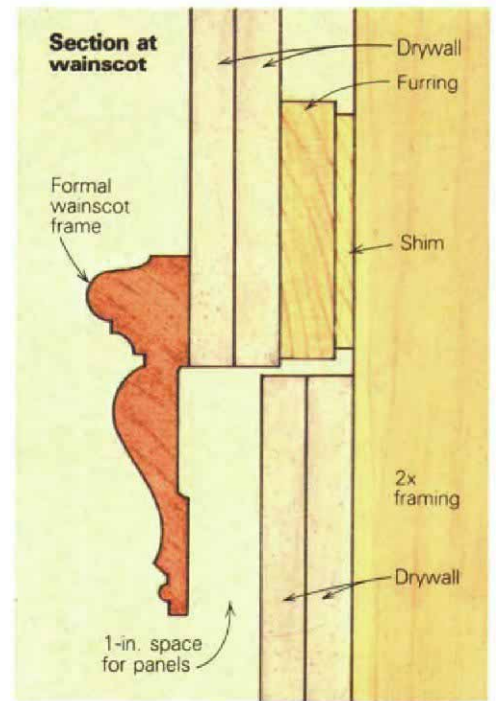
Wainscot—The lower portions of the walls detailed in both Federal and formal styles are paneled with wainscoting. To accommodate the thickness of wainscoting and ensure straight walls, we furred the drywall above wainscot height with 1x4s and shims (drawing, facing page). This helped us to make up for the variations in thickness and inevitable warps in the framing lumber. Wainscot panels were delivered to the house in assembled sections. Measure-

Coffered ceilings and Mission-style trim work create a sumptuous atmosphere in the screening room, recreating the aura of Hollywood in the 1930s. When the projector rolls, there's room for 37 viewers in overstuffed chairs and couches covered in velvet.





Wainscot frames were glued and screwed together from the back, then router-mortised for draw bolts. The individual panels were then glued together, with the draw bolts applying pressure as the glue set up. To make sure the wainscot casings would lie flat, the panel backings were shimmed into alignment (drawing, right). A finished panel installation can be seen in the photo on p. 44.



ments for the panel runs were taken in the field, and layouts were made in the shop. We used panels of various widths to fit each situation.

Panel units were put together with draw bolts and screws, as shown in the photo above. Adjoining sections were mortised for the draw bolts in the mill shop. In the field, we assembled all the parts of a panel run with glue and draw bolts and lifted the entire assembly into place. This way we got the best possible fits at the rail joints. Providing accurate backing was an extremely important part of the job. It had to be plumb, level and straight, and in alignment with the wall surface so the casings and wainscot cap would lie flat.

Coped joinery—There are thousands of coped joints in the Main House, from base shoe to crown and everywhere between. By far the most difficult cope cuts were those that fit to turnings, such as the one at the main stair (bottom left photo, p. 45). There was no way to precut these joints, and they had to be made by fitting and cutting. The material at the outermost part of the crown became very thin. With files and gouges, the backs were cut away until the profile of the crown fit properly to the turning.

Within the capacity of a 10-in. power miter box, moldings could be precut and then coped. On larger pieces such as semi-formal crown, the board was laid flat and compound-cut on the Rockwell (now Delta) Sawbuck. Depending on the shape of the back of the stock, it could be cut at about a 32° bevel with a 45° miter.

We set up one Sawbuck just to cut wide moldings. With a 40-tooth carbide-tipped blade, it made clean cuts, but we had constant trouble with the adjustable fence linkage. So we removed the fence and linkage, as well as the folding legs and wheels. We mounted what was left of the tool to a bench with extension tables, and then attached a rigid fence to the brackets on which the original fence had traveled.

Doors—A book could be written about the doors and hardware. All doors were made in our shop. There are fire doors, sound-gasketed doors, pocket doors up to 5 ft. by 9 ft., and many other kinds, too. We were licensed to manufacture twenty-minute-rated redwood panel doors. These have 2¼-in. thick rails and stiles, and ¾-in. panels glued back-to-back over ¼-in. Flametest, a fire-resistant material manufactured by the Masonite Co. (200 Mason Way, City of Industry, Calif. 91746). The panel, sticking and muntin designs match the different trim styles in the house. Doors that lead from one trim area to another have different patterns on each side. Some doors have four panels with informal trim profiles on one face, and two panels with formal profiles on the opposite side. Leading into Lucas' office, which is trimmed in oak, are two pairs of 3-ft. by 7½-ft. doors with redwood panel construction on one side and oak on the other. They came to be known as "redoak" doors. The doors from the conference room to the screened porch are redwood on one side and Douglas fir on the other.

We hung all the doors using a Stanley (now Bosch) router and template to mortise for hinges. All fire-rated doors have concealed closers mortised into the top rail. The mortises are lined with sheet metal so fire won't burn through the thin wood near the closers. For soundproofing, many doors have drop seals cut into the bottom rail. These spring-operated rubber gaskets press against the threshold when the door is closed.

Locksets are all box-mortise type. We used hinges with steeple pins, ball pins or flat pins, depending on the adjacent trim. One carpenter spent six months installing door hardware.

Library—The library was designed to look as if it had been built as an addition in the 1930s. The screening room is in a similar Mission style, as if it had been renovated at the same time. On the library wing, even the exterior siding is dif-

ferent to indicate its more recent place in the story. The library is bathed in the warm glow of amber light filtering through the 19-ft. dia. art-glass dome (top photo, next page) and through high windows around the mezzanine. All surfaces—bookcases, walls, coffered ceilings, moldings, headers and crowns—are redwood.

The plywood paneling for the walls and ceiling was made on site in our mill shop, where the 6-in. wide veneers from the beams were book-matched and laminated to plywood or particle-board cores. The shop people applied veneers to both sides to prevent warpage. In all, 200 sheets were made from 8 ft. to 10 ft. long by 40 in. wide. To square off the ceiling around the art-glass dome, four triangular panels with wedge-shaped veneers were scribe-fitted to match the radius of the ring beam that carries the dome. The beam is a tubular-steel compression ring faced with laminated curved boards on the sides and a bandsawn 2x on the bottom.

The library presented a tough layout job. Its design is based on a gridwork of radial lines, continuous from the ceiling to the windows to the pilasters on the mezzanine, through the railing to the ceiling under the mezzanine and to the battens and pilasters on the first floor.

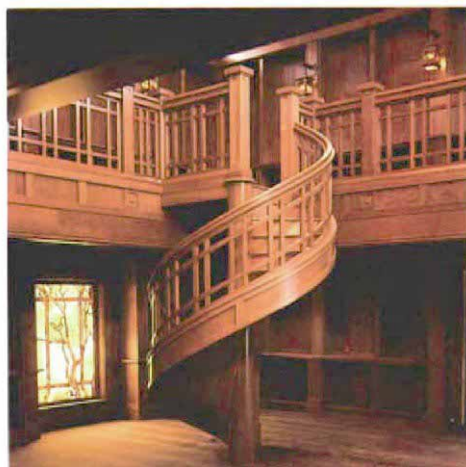
A fireplace of dark red clinker brick with stepped corbeling is the focal point of the west wall. The brick was chosen because of its irregularities, which gave the hearth and facing a rustic texture. The mason carefully set the brick in uniform courses. He was particularly pleased with the way it looked. He cleaned up and went home. In the late afternoon the designer responsible for the library went out to inspect the fireplace. He picked up the mason's trowel and tapped a brick here, a brick there. To him it was too uniform. The following morning the mason returned. He was dumbfounded. Yet another example of collaboration.

Elegant in its singular deviation from the straight and angled is the spiral staircase. Built



Many specialized studios were set up to supply the Main House with furnishings and hardware during its construction. Among them was the Skywalker Art Glass Studio, which crafted the lanterns and the hanging lamps, as well as the 19-ft. dia. leaded-glass dome that tops the Main House library (above). This view is from the mezzanine level.

The library mezzanine is reached by way of a spiral staircase (right), which was built around a hollow redwood column housing a 4x4 post that ties into the railing. The 1x4s sheathing the belly of the stair are made up of ¼-in. thick strips, laminated together on a form built to simulate the curvature of the stair. The treads were made of Honduras mahogany, which wears better than redwood.



entirely of wood, the staircase (photo bottom left) was milled and pre-assembled in the shop. The spiraling parts—stringer, rail and trim—were laminated on a 5-ft. dia. cylindrical form that looked like a great paddle wheel. With a 3-in. steel pipe as its axle, the form could be turned as boards were glued and clamped to it, and as parts were shaped. The stairway's center post was built out of staves glued around plywood circles with a 4x4 post extending through and projecting out the top to support the handrail. The underside of the stairway is paneled with 1x4s. The 1x4 compound-curve belly boards were laminated from ¼-in. thick strips bent over a form matching the structure of the stairs. The strips were glued and clamped in sets spanning the width of the stairs. Each piece was meticulously scraped and sanded to smooth the surface. The stair was finished in the mill shop, trucked to the Main House, and then twisted like a corkscrew into the library through a rough opening for one of the art-glass windows.

Library railing—To build the railing, we first framed a plywood curb between the rough 4x4 posts, which were bolted to the mezzanine rim joists. Meanwhile the shop crew made up the frame-and-panel post wraps. They are detailed with rabbet joints at the corners. In the top end, a 1x cap was inset for nailing into the post. Then we tacked shims to the bases of the 4xs to align all the post wraps and space them equally. When the wraps were slipped over the posts they were plumbed and the top 1x was nailed to its post.

Next we trimmed the curb between the posts. The top cap of the handrail is grooved for the bottom rail to nest in. All of the 2x2 baluster and rail material was milled, and the balusters were cut to length in the shop. On a router table, we dadoed the balusters to accept the rails. The length of each rail section varied slightly, so the rail pieces were different lengths in each bay. All of the 2x2 parts were put together on the bench except the mid-rails at the ends. These were left out to allow for screws into the posts. Once these sections were in place, the handrail was built up and set in place as a unit. Finally the post caps were assembled with mitered frames and nailed on.

Trimming out the Main House was a once-in-a-lifetime experience. That high standard of quality and access to the necessary expertise and tools made the job unique. The mill was right there to make all the parts, tailored to fit whatever circumstance required. The painters and finishers collaborated at each step to prepare, seal and finish the material. Their work ultimately gives the house its smooth, clean look. People from all departments were in constant communication. The designers and draftsmen, project managers and foremen, millworkers and carpenters all took part in seeing the job through. There was all the hustle and bustle of a large project, yet it came together with the kind of close teamwork that usually only happens on small crews. I'm still amazed by what we built. □

Rick Wachs was trim foreman on the Main House project. He is a member of Carpenter's Union Local #35, and lives in Mill Valley, Calif.