Train Room History & Description

Moffett Field Historical Society Museum

By Al Margolis (Draft 6/6/2021)

Overview

The model railroad (MRR) began life around 1983 as a recreational activity for active duty Naval Air personnel and families stationed at Moffett Field. It appears that activity continued until the xxx was deativated in 1994. It appears that the MRR was unused but intact for about five years when it was taken over as a private club activity by a group of retired military and NASA Ames employees. Around 2005 the Moffett Field Historical Museum began renting the building including the train room. It's not clear that the train club ever had formal approval to use the space. Eventually it was agreed that the Train Room would become an exhibit of the museum.

Geography of the Santa Clara, Gilroy and Fresno Model Railroad (SCG&F RR)

The SCG&F models an imaginary railroad connecting the city of Sunnyvale in Santa Clara County at the southern end of the San Francisco Peninsula to Fresno in the Central Valley. Most of the locations identified on the MRR are actual locations in the region. The northernmost station is Sunnyvale. A car trip from Sunnyvale to Fresno is about 150 miles and takes about three hours. A full loop of the SCG&F traverses about 200 feet of track and takes about 10 minutes.

If this were a real railroad the route could be from Fresno, through the Pacheco Pass, Gilroy, San Jose, Santa Clara ending in Sunnyvale. Tres Pinos would most likely have been on a branch route from Gilroy, not on the main route.

Conceivably there could be a route from Fresno to Tres Pinos to Gilroy. That would not go through the Pacheco Pass. In that case "East Pacheco" could be an imaginary place on that route, not related to Pacheco Pass as I am guessing.

The Keyes River Bridge does not appear to represent a real place. There is a small Central Valley community of Keyes near Turlock but that would be out of the way for any Fresno to Gilroy route. The Diablo Range mountains between the Central Valley and the south part of the Bay Area are fairly high, so you could easily imagine some dramatic scenery as represented by the Keyes River Bridge and Mountain Helix. For a big river, like the modeled Keyes River you'd also have to imagine an amazing amount of rain and maybe snowpack for that region.

SCG&F Build Eras

Era 1 - The Grand Design: It appears that from the start the club had a grand plan for a very complex layout. It appears that framing, track and scenery were built fairly closely to plan. This is based on drawings and photographs we have found that indicate the structure we see today seems consistent with the earliest records. The electronics concept seems very advanced for its day. It appears that the goal was to have up to 8 custom throttles with walk-around controls supporting complex train operations. There are over 200 electrical blocks most of which were intended to be assigned to any throttle. There are many dozens of electrical relays and several custom digital IC circuit boards used to implement throttle assignment, prevent track conflicts and operate trackside signals. It's not clear how much of this ever worked.

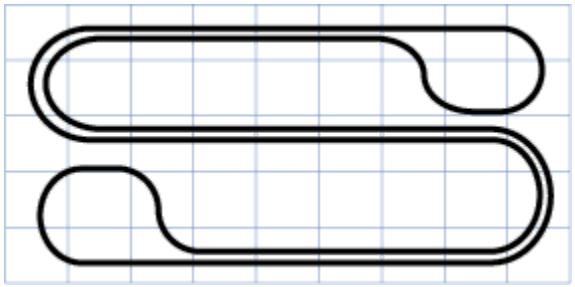
Era 2 - Reality Sets In: At some point it must have been recognized that the original plan was not going to work. I don't really have good descriptions of either the original design or the revised design, but I have found a 300-step re-wiring checklist. This checklist was clearly from early in the history because it is handwritten like most of the other early design documents that we have. There are a handful of later design documents that were printed on a dot matrix printer which probably indicates that Era 2 began fairly early in the MRR build-out.

Era 3 - Private Club: The club probably discovered a complex electrical system that was operating with limited functionality and was hard to use and understand. Somewhere in this era two commercial throttles were patched in to replace the custom throttles and LED indicators were added to the control panels. This era appears to have begun around 1999 and continued until 2020.

Era 4 - Museum Exhibit: I began volunteering in the fall of 2020. At that time the MRR was running but had operational problems. The trains ran most of the time but it was not unusual for there to be problems and correcting them was a slow hit-or-miss process. I began a process of analyzing the design documents, studying the actual circuitry and fixing actual electrical problems where I could identify them. About the same time, another new volunteer arrived who took care of deferred maintenance of the top side of the MRR: cleaning track and repairing rolling stock which had numerous problems regarding couplers, weight and wheels. Within a few months we were able to run a continuous loop with excellent reliability..

Physical Layout

The SCG&F fully occupies a 25’ x 20’ room. The trains run along all four walls with a peninsula in the middle. If you were to straighten out the layout, it would form what is often called a dogbone. A long skinny table with large loops at each end. The length of the dogbone would be approximately 100 feet. The loops at the end are helices that move trains between levels.



The layout seems to have been designed primarily for interesting operations. It has an amazing amount of track. Except for the main helix, the entire mainline is double tracked with lots of passing tracks, crossovers, sidings and yards.

The layout occupies four levels.

- Level 0 is the lowest level and occupies the entire layout space. It represents the California Central Valley, dominated by the city of Fresno. This area is minimally sceniced with lots of staging tracks. Level 0 reaches the other levels only at the main helix. There is one track leading to Sunnyvale on Level 1 and one track leading to Canyon on Level 2. The track to Level 1 is a magical route to support continuous running. The track to Level 2 is a logical connection climbing out of the Central Valley to mountain regions before descending to Gilroy and the rest of Santa Clara County.
- Level 1 is the Northern portion of the layout and most visible to average height adults. Level 1 occupies the entire layout space. It represents Santa Clara County from Sunnyvale to Gilroy. After trains pass Gilroy at the end of the peninsula they enter a tunnel which circles up to Level 2.
- Level 2 is the highest level of the layout on the peninsula and along the North Wall. Level 2 occupies the entire layout space. It represents a mid-mountain region southeast of Gilroy heading toward the Central Valley.
- Level 3 is the highest level of the layout above the main helix and along the South and West Walls. It represents the highest mountain region Southeast of Gilroy. It connects to

Level 2 on a grade ending in East Pacheco at the corner of the West and North Walls. Level 3 features a mining community with a mix of standard and narrow gauge track.

Route Directions & Track Conflict Rules

Wikipedia has some guidance regarding railroad direction naming: https://en.wikipedia.org/wiki/Rail_directions

Since we don't have information from the origins SCG&F builders, we have adopted the North American railway standard. All routes are identified as Eastbound and Westbound. These directions also have significance in resolving conflicts between trains running in opposite directions. For example, many railroads specify that trains of equal class running to the east are *superior* to those running west. This means that, if two trains are approaching a passing siding on a single-track line, the *inferior* westbound train must "take the siding" and wait there for the *superior* eastbound train to pass. Even-numbered trains (superior) travel east (or north). Odd-numbered trains (inferior) travel west (or south).

Level 0 includes a full loop from Valley Junction, through Fresno, looping under the mountain then back through Fresno to Valley Junction. The tracks from Valley Junction heading toward Fresno are considered the Outbound direction. The return is considered Inbound. That is outbound from Sunnyvale and inbound to Sunnyvale.

Highlights of Eastbound Loop from Sunnyvale to Fresno

- Sunnyvale (Level 1)
- Bowers Avenue Crossing
- Santa Clara
- XXX Engine Service Yard with roundhouse
- San Jose Cahill Station
- Operator Station @ Level 1
- Coyote Wye
- Gilroy
- Mountain Tunnel Helix (Level 1 up to Level 2) Climb from Santa Clara Valley to the mountain region crossing the Pacific Range.
- Keyes River Bridge
- Summit Wye
- Operator Station @ Level 2
- Hillside Terminal with roundhouse
- East Pacheco (branch to Level 3 XXX)
- Canyon

- Main Helix Route 1 (Level 2 to Level 0, inside track in double track section of helix). Descent from mountains to Central Valley.
- Valley Junction (Outbound)
- Fresno (Outbound)
- Bayshore Yard (Outbound)
- Operator Station @ Level 0 (Crossing Inside Aisle to Peninsula (Outbound)
- 1st Avenue (Outbound)

This is the logical end of the line. The layout has a loop under the mountain which continues with a double track Inbound set of tracks through 1st Avenue, Bayshore Yard, Fresno and the entry of the main helix at Valley Junction. From Valley Junction trains can either take the magical route to Sunnyvale on Level 1 to endlessly repeat the southbound journey or climb up to Level 2 to complete the trip with a more realistic route. When taking the realistic route, the train arrives at Sunnyvale with the engine at the wrong end of the train for the return trip. Sunnyvale has a range of industrial sidings and sorting tracks to arrange a return consist as needed. It does not have a turntable. It does have run-around tracks so the engine can be moved to the head of the train. If desired, the engine can be turned around in San Jose.

Most of the layout has double tracked mainlines, so two trains can be run simultaneously with no track conflict except at the helix. The helix has two routes, both of which are single tracked. Almost any conceivable routing to the mainlines can be supported by the many turnouts and crossovers leading to the helix.

Fun Facts

- 30 scale miles of track (about 1800 actual feet)
- 19 control panels with schematic track outlines, block control switches, turnout control switches and LED indicators
- 224 electrical blocks and corresponding control panel switches
- 190 turnouts (track switch tracks) and corresponding drive motors and control panel switches
- 300 “little people” populate the layout
- There are 90+ structures including the six-foot long San Jose station.
- The mountain was built using more than 500 pounds of Hydrocol plaster
- The electrical system uses over 10,000 feet of wire
- If the layout table were straightened out from its J-ish shape it would be about 70 feet long. If you were to move each level out to the ends, it would be about 250 feet long.

Common Questions and Answers

Q: Why is there only one train running?

A: The electronics to control the trains are old and unreliable and are being refurbished. We just got the first train running reliably. We will be adding more trains running simultaneously over the next few months.

Q: Is the layout DC or DCC? (This has to do with how the train is controlled.)

A: The layout is DC with over 200 electrical blocks and a complex system of relays and custom PCBs (Printed Circuit Boards) to control signals and provide turnout protection. We are in the process of refurbishing and modernizing this system.

Notes on Moffett Field MRR records

Rich Mikesell - Initiation in 1982, first listed financial transaction, presumably the first recorded member of the club? No personal membership records listed.
Ken Thompson - Club member from 1987-1993, listed on bank records following 1989. Bank records go back through 1988, but only under a general Moffett Field name.

1982 members: Earliest members listed in financial information - maybe founded the club? There is very little paperwork from the first few years.
Rich Mikesell
Aggie Miller
Arnold Kenstenbaum

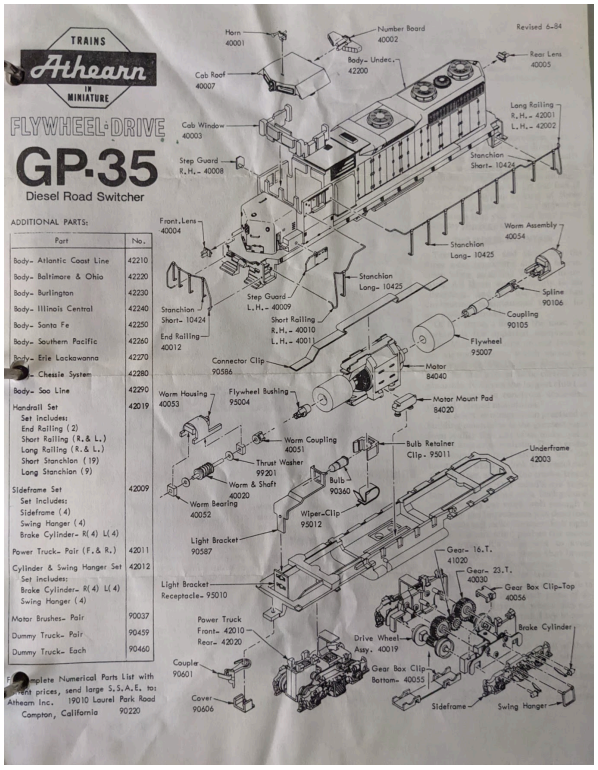
Thin black binder (1985?)
Plans for cutting wood for the helix and electrical work checklists. A timeline of the work done to build the railroad could probably be made from this, but I don't understand the work being done well enough to do that. When is this from? No names or dates included, mix of handwritten work and old printed work. Contains diagrams that might make for good visual references.

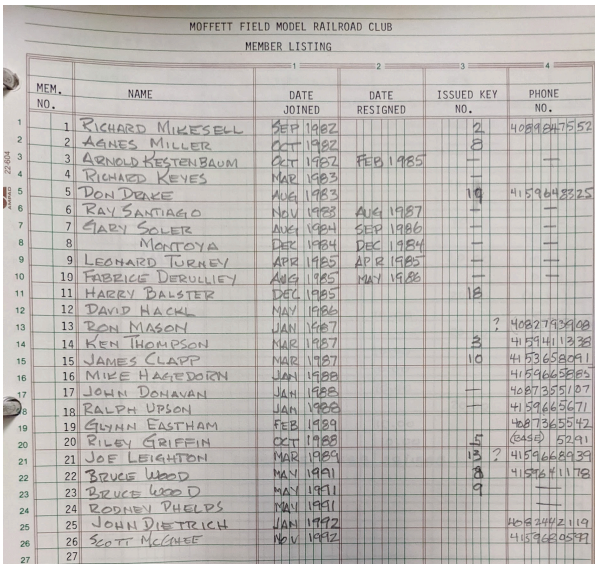
White binder 2021-2015
Contains references and assembly instructions for models. Includes exploded diagrams of structures and rolling stock. I think scanning some of these diagrams might be good to get interesting visual references. Most of the structures in this boo
k can still be found in the train room! (furniture store, truss bridge, freight station)
Thick black binder 1982-1993
Financial and membership records. Can be used to form a timeline for who was in the club, and when parts were bought for the work being done on the railroad. The payments are a bit vague on what work was being done, but they are very clear on when transactions were being made. Appears to cover club finances from 1982-1993.
(In 1994 NASA took over Moffett Field)

The club was supported by air show fundraisers, donations, and dues. Most of the club's expenses were split between tracks, tools, scenery, structures, rolling stock, operating supplies, electrical equipment, and hardware. Club members would often buy parts for the club with their own finances, and the expenses would be taken off their dues. Each club member paid $20 for initiation, and $10 per month for club dues.

Manilla packet -
Conversations from 2012-2015 about electrical work and model railroad maintenance between John Donovan, Don Pomplun, Rob Paisley, and George Campbell.

Putting some photos I took of interesting visuals/useful information. I think scanning some of these to get better pictures would be good.

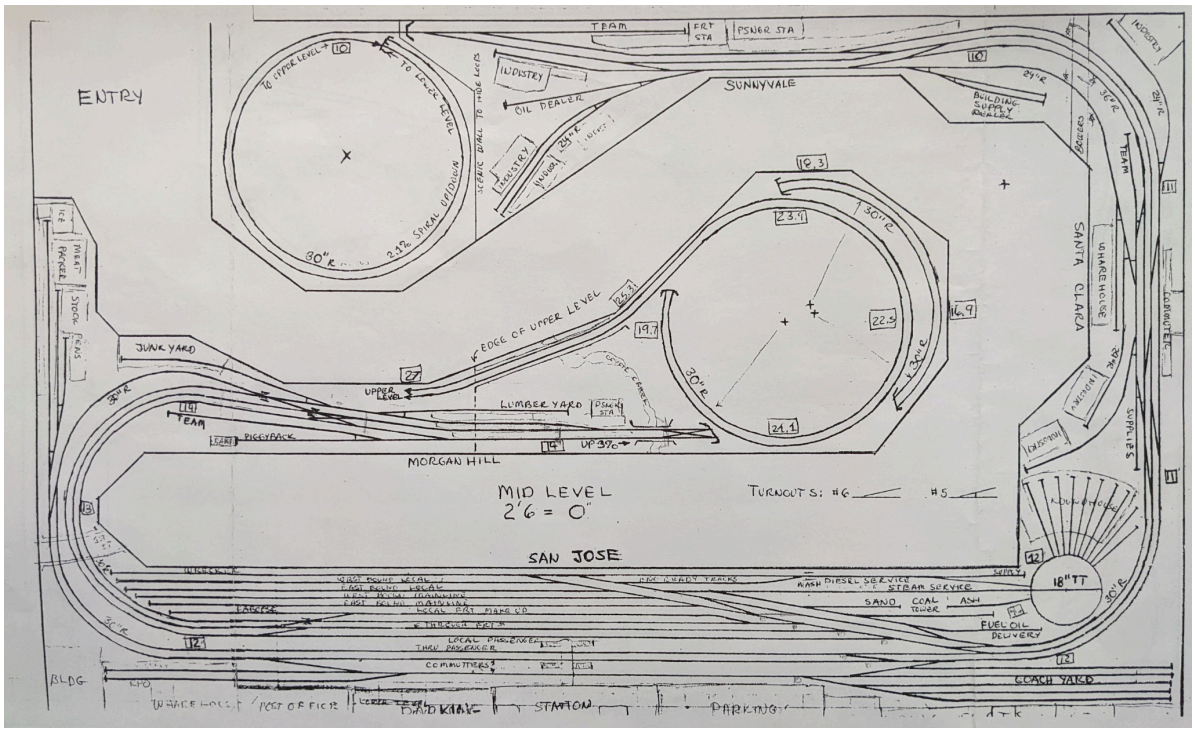




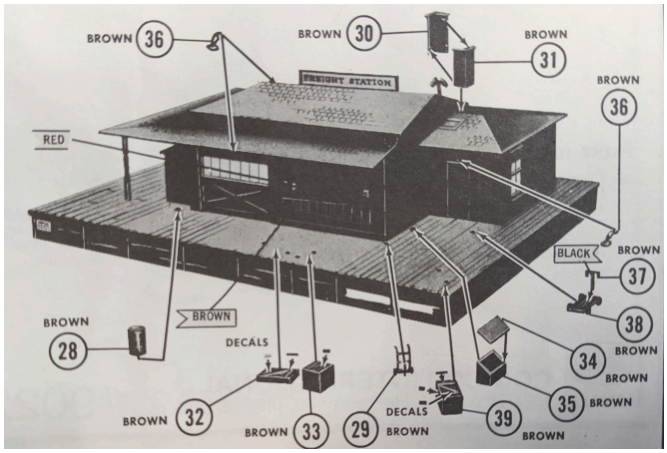
MOFFETT FIELD MODEL RAILROAD CLUB

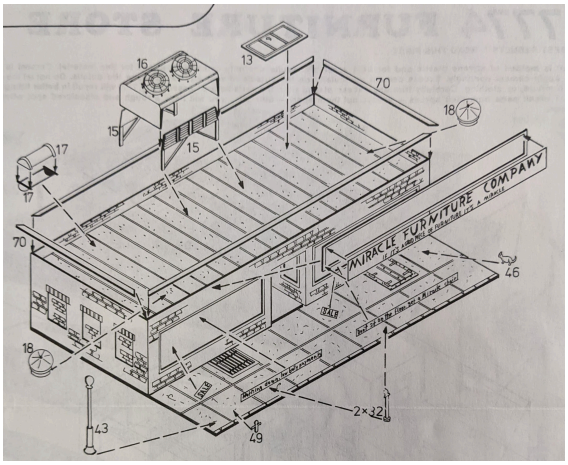
MEMBER LISTING

MEM. NO.	NAME	DATE JOINED	DATE RESIGNED	ISSUED KEY NO.	PHONE NO.
1	RICHARD MIKESELL	SEP 1982		2	4089847552
2	AGNES MILLER	OCT 1982		8	
3	ARNOLD KESTENBAUM	OCT 1982	FEB 1985	—	—
4	RICHARD KEYES	MAR 1983		—	
5	DON DRAKE	AUG 1983		10	4159649325
6	RAY SANTIAGO	NOV 1983	AUG 1987	—	—
7	GARY SOLER	AUG 1984	SEP 1986	—	—
8	MONTOYA	DEC 1984	DEC 1984	—	—
9	LEONARD TURNEY	APR 1985	APR 1985	—	—
10	FABRICE DERULLEY	AUG 1985	MAY 1986	—	—
11	HARRY BALSTER	DEC 1985		18	
12	DAVID HACKL	MAY 1986			
13	RON MASON	JAN 1987			? 4082799408
14	KEN THOMPSON	MAR 1987		3	4159411338
15	JAMES CLAPP	MAR 1987		10	4153658091
16	MIKE HAGEDORN	JAN 1988		—	4159665565
17	JOHN DONAVAN	JAN 1988		—	4087355107
18	RALPH UPSON	JAN 1988		—	4159665671
19	GLYNN EASTHAM	FEB 1989		—	4087365542
20	RILEY GRIFFIN	OCT 1988		17	(645E) 5241
21	JOE LEIGHTON	MAR 1989		13	? 4159668939
22	BRUCE WOOD	MAY 1991		8	415764111778
23	BRUCE WOOD	MAY 1991		9	—
24	RODNEY PHELPS	MAY 1991			—
25	JOHN DIETRICH	JAN 1992			4084492119
26	SCOTT MCCHEE	NOV 1992			4159660577
27					



*There are more diagrams like these





I was talking to Mary last week about how cool it would be to make some sort of scavenger hunt? Considering how much younger kids enjoy visiting the train room, and how much intricate detail there is in the display, it might be a fun way to explore the exhibit. Recognizing these diagrams from running the train room reminded me of this idea, so I thought I'd leave the note here. There are a few other diagrams that I think could probably still be found in the train room, but these were the first ones I recognized.