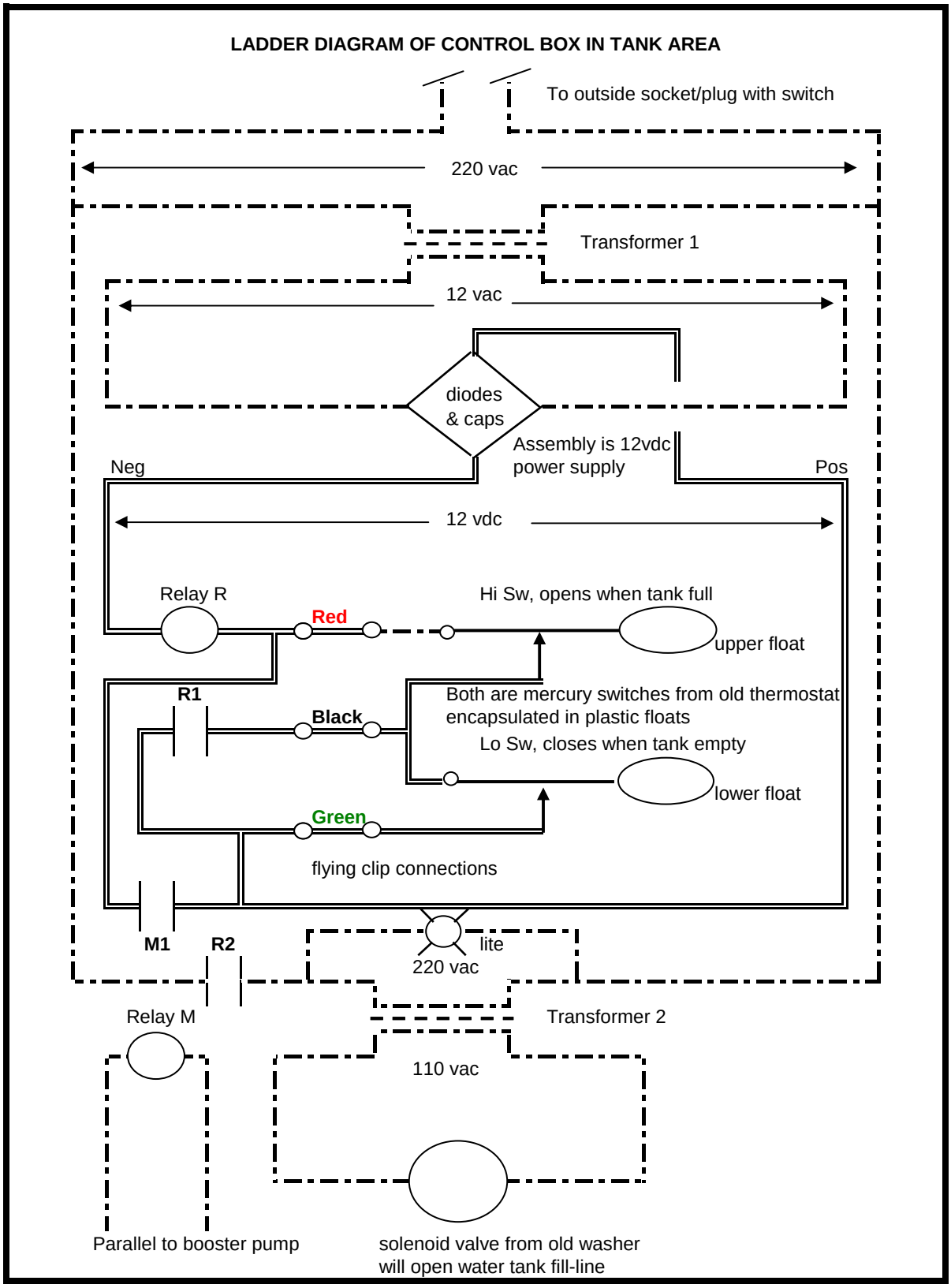
UPDATED WATER SYSTEM IN TANJAY HOUSE



Sequence of Operation:

1 When water tank is empty, both upper and lower floats are in down position and switch U and switch L are closed (line 26 & 33) respectively.
2 This energizes coil R (line 26), which closes NO contact R1 (line 31) and self-locks the coil.
3 NO contact R2 (line 40) closes and energizes solenoid water valve (line 48) via step down transformer (line 42). Indicator (line 38) light enegizes.
4 Water starts filling tank. When water level reaches lower float, Sw L opens (line 32) but R coil remains locked in, so solenoid remains energized and water fills tank.
5 When water reaches upper float, Sw U opens and breaks contact with R coil, R1 & R2 open, and solenoid valve closes.
6 As water is drawn from the tank, water level drops and upper float and switch closes, but R coil is not energized because of open contact R1.
7 As water level drops, lower float will eventully close, and will energize relay R, restarting sequence 2
8 When booster pump is run, relay M1 (line 43) energizes and closes contact M1 (line 39). If water level in tank has not yet closed lower float swich, M! will energize and lock in Relay R to start fill cycle.

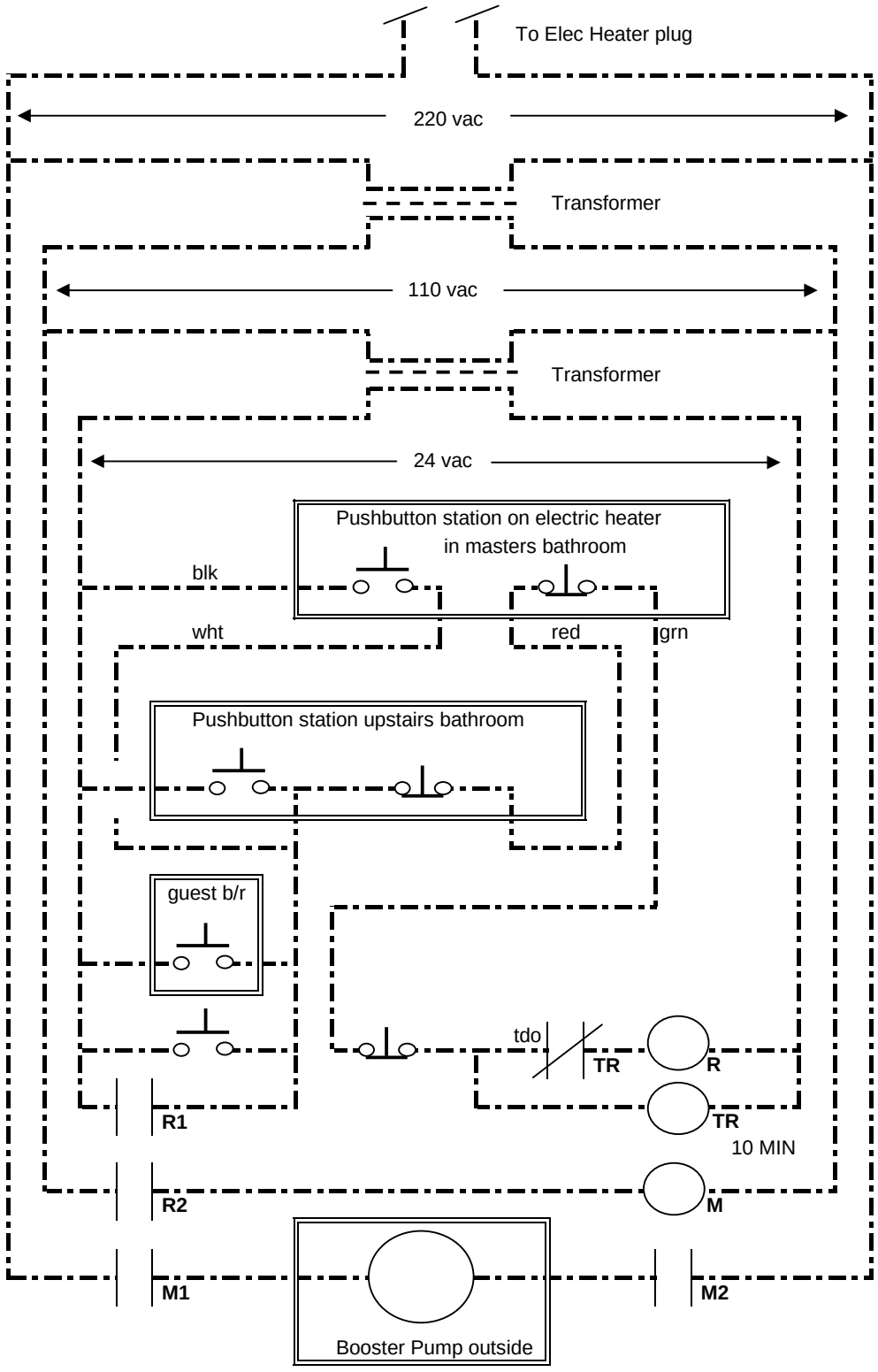
See House Photos & Diagram, page 6

Plastic box protecting 12 vdc power supply and wiring

Solenoid valve for water tank fill line

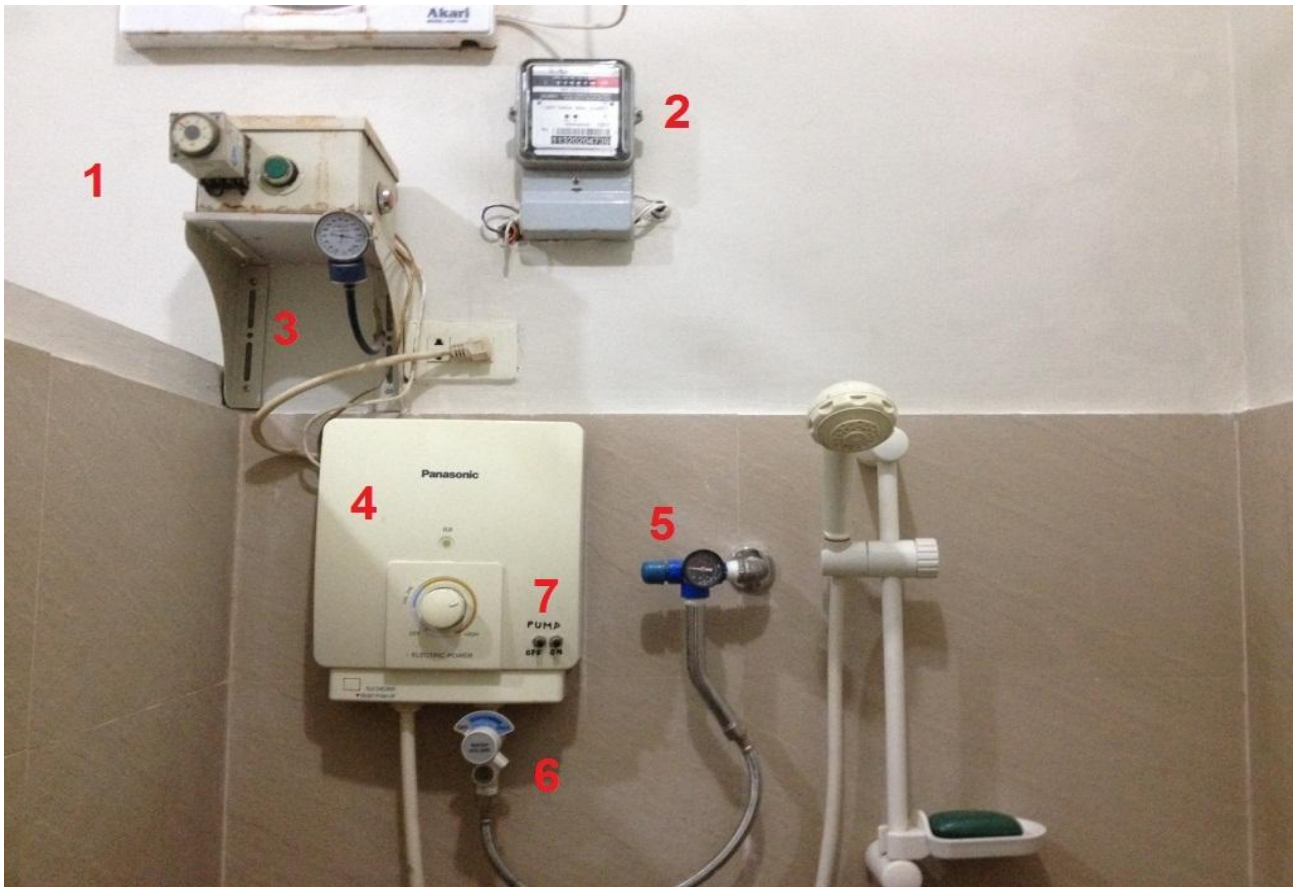
Booster water pump

LADDER DIAGRAM OF BOOSTER PUMP CONTROL BOX IN MASTER'S BATHROOM



Sequence of Operation:

Pushing any of the 4 normally open (NO) pushbuttons (PB) on lines 24, 31, 37 & 40 (three are remote) will energize relay **R** (line 40), which locks in itself via NO contact **R1** (line 42). Timer **TR** on line 42 starts counting 20 min. **R2** on line 45 also closes and energizes relay **M**, which closes **M1, M2** and starts pump (all on line 48). If any of the three remote normally closed (NC) PBs are pushed, circuit is broken to **R** and **TR**, and relays **R1**, **R2**, **M1** & **M2** open and pump stops, and timer resets. If system is kept on longer than 20 minutes (actually adjustable up to 60 minutes), timer will time out and open NC contact **TR** (lline 42) and stop and reset system. User may push start PB again.



New shower room fixtures, equipment and controls:

1. Control box. See electrical diagram above.
2. Watt-hour meter
3. Tank water level indicator using sphymomanometer
4. Electric water heater
5. Pressure gauge for water lline .
6. Flow control valve for shower
7. Start-Stop micro pushbutton station for booster pump

Sequence of operation:

A. If street mains pressure is high, water flows into all house fixtures, and fills up overhead tank. Water heater can operate.
B. If pressue is inadequate to run water heater, or reach second floor fixtures, booster is started so pump draws water from overhead tank and pressurizes all house piping. Water cannot run out to street mains because of check valves.
C. Timer shuts off booster pump after 30 (adjustable) minutes.
D. Overhead tank level is indicated by sphynomanometer.
E. Watthour meter totalizes all power used for pump and water heater

SELECTED HOUSE PIPING PHOTOS (now outdated) AND SCHEMATICS

Sequence of operation:

1. Booster pump is run only when mains water pressure is too low to have enough water flow through electric water heaters in Masters, Annex and 2nd floor T&B. Or in item 5 below. Pushbutton switches are on automatic 10 minute timer control in Master and 2nd floor T&B.
2. Municipal water presure is normally high enough to keep overhead water tank full all the time.
3. When municipal water is turbid after heavy rains, it is usually shut off for a few hours by Water District. Alternately, it can be manually valved off at water meters.
4. With no municipal water, overhead tank supplies water by gravity. Pressure can be boosted by pump. Water cannot run back to mains due to check valves.
5. Small 15 watt solar pump is run during daytime and it circulates water which gets heated and accumulated in tank. Booster pump is run to use solar heated water.

Two water meters in garage

Sphygmo as a tank level gauge

Pipes/valving on tank pylon

Hose on low roof & overhead tank on conc pylon/platform

Pressure cooker as enclosure for solar fish-tank pump, 15 watt

Booster pump and piping

Legend:

Valves, normally open

Valves, faucets, normally closed

Check or one-way valve