



ELEVATOR
CONTROL Corp.

SWIFT[®] 5000

ADJUSTMENT PROCEDURE GUIDE

(SCR DRIVE)

*Preliminary
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I. EQUIPMENT VERIFICATION

Every SWIFT® 5000 controller has been factory tested and is ready to operate provided the power and control connections have been properly made and the following steps are followed. At this stage all power to the controller should be off.

The following steps are used for equipment verification:

- A. Verify that all power terminal screws are tight.
- B. Verify that the incoming three phase AC power is the proper voltage and the isolation transformer is tapped correctly for the proper voltage according to the Power Distribution print.
- C. Verify that all emergency limit switches are operational.
- D. Verify that the following connectors are properly oriented.
 1. DAR: The 8 position J1 connector is polarized. Verify that pin 1 is facing towards the top.
 2. PMI: Verify that each PMI connector is connected to its respective board and pin 1 is facing towards the top.
 3. GVI: Located in the back of the controller mounted on top of the 7PC board inside the Magnetek DC drive. Verify that all connectors are secure and inserted properly.
 4. Read the Magnetek DC drive manual and become familiar with the locations of all the relays, contacts and printed circuit boards. Verify that all internal drive connections are secure.

II. TURNING ON POWER

CAUTION: The following steps must be performed prior to applying power to the controller:

- Turn off the front panel circuit breaker, the I/O and CPU switches, and place the panel inspection switch to "TEST".
- DO NOT insert the printed circuit boards into the card cage at this time. This will be done after verification of all power supplies.

WARNING: Make sure the controller is properly grounded before applying power. The ground wire should be stranded and at least 6 AWG thick. Refer to ground diagram (APPENDIX A) for the configuration of grounding SWIFT® controllers. Verify the main line voltage at the service disconnect switch to make sure it is as per the Power Distribution schematic. Verify the taps on the T1 transformer (located on the bottom of controller).

A. Main and I/O Voltage Measurements

1. Turn on the main line disconnect.

The Magnetek DC drive gets started as soon as the main line disconnect is turned on. Observe the green READY LED on the 12SCR Controller PCB. If the LED does not light, check for proper voltage between input power lines or for blown main line fuse.

CAUTION: Before proceeding any further, verify that the following power is present.

2. Set the voltmeter for AC voltage, 300 volt scale, and measure the voltage at the following terminal points:
 - a. 208VAC across all 3 secondary phases (X1, X2 and X3)
 - b. 115VAC from X0 to X1, X0 to X2, and X0 to X3 at the T1 transformer
 - c. 115VAC from Z1 to Z2 at the T1 transformer
 - d. 115VAC from Y1 to Y2 at the T1 transformer
3. Circuit breaker CB1 controls the 3 phase 208VAC power to the door rectifiers, the brake coil rectifiers and to a contact of switch S2 (I/O switch) supplying the relay logic circuit with 115VAC (phase L11).
4. Closing CB1 breaker supplies power to the door operator circuit (280 VDC output)
5. Turn switch S2 (I/O switch) to on position and make certain the following terminal points measure as indicated:
 - a. 115VAC to the relay logic circuit LCS and LSN to LCO
 - b. 24VDC to the low voltage control circuit V+ to VC
 - c. 24VDC to the PI and Car Call circuitry VL+ to VC
 - d. 115VAC to the Hall Lantern circuitry (if required – refer to job diagrams)

CAUTION: Before proceeding any further, verify that the following power is present.

6. Set the voltmeter for AC Voltage, 300 Volt scale, and test the following terminal points:
 - a. 115VAC from X0 to L11, X0 to L12, and X0 to L13 terminals located on the rear panel
 - b. 115VAC from SC to LL terminals on rear panel
 - c. 115VAC from SC to SV terminals on rear panel
 - d. 115VAC from LCO to LCS and LSN terminals located in the front
7. Set the voltmeter for DC Voltage, and test the following terminal points:
 - a. 280VDC from (-) to (+) (Door operator voltage) terminals on rear panel
 - b. 24VDC from V+ to VC terminals located on the front and rear panel
 - c. 24VDC from VL+ to VC terminals located on the front and rear panel (If required)

B. Card Cage Voltage Measurements

1. Closing switch S1 (CPU switch) supplies the +5VDC and +/-12VDC to the card cage multibus. The three (3) inch fan, located below the card cage positioned under the CPU and DAR, should be on.
2. Set the voltmeter to DC voltage, and test the following terminal points in the P1 power supply located on the top of the card cage:
 - a. +5VDC at studs 1 to 3 on the TB2 terminal strip.
 - b. +12VDC at studs 7 to 3 on the TB2 terminal strip.
 - c. -12VDC at studs 8 to 3 on the TB2 terminal strip.

C. Installation of the Printed Circuit Boards

Turn off the CPU switch, the I/O switch and the CB1 circuit breaker. Proceed to insert the printed circuit board as follows:

1. Insert the CPU board in slot #1, the right most slot when facing the card cage.
2. Insert the DAR board in slot #2. Connect the 8 position connector.
3. Insert PMI #1 into slot #3. Connect the 30 pin connector marked for PMI #1.
4. Insert the rest of the PMI boards. Connect the 30 pin connectors to their matching PMI boards.

At this point all boards should be inserted and the power ready to be turned on.

III. TURNING ON PROCESSOR POWER

A. Before proceeding, it is important to read Section II for the necessary precautions to take prior to and after turning on power.

B. The following steps must be taken to turn on processor power:

1. Connect the diagnostic terminal to the human interface port of the CPU. The red line on the ribbon must be on top. *(Refer to the SMF-5000 manual or the terminal's user's guide on setting up the terminal).*
2. Apply power to the controller following the steps outlined in Section II. The car must be on PANEL TEST operation.
3. Turn the CPU switch ON.
4. The System Confidence Test will appear on the screen of the diagnostic terminal. The Memory, DAR and PMI messages should all be "GO".
5. If a "NO-GO" message appears, possible solutions are:
 - a. Memory NO-GO: Replace the CPU board.
 - b. DAR NO-GO: Verify that it is properly inserted in the 2nd slot of the card cage. If it still fails, replace the board.
 - c. PMI ## NO-GO: Verify that the PMI board is properly inserted and that it has the correct address jumpers (refer to the PMI sheets for jumpers). If PMI #1, insert in the 3rd slot of the card cage. If the test still fails, replace that pmi board.
 - d. EEPROM NO-GO: The value of a parameter is invalid. After entering the password on the diagnostic terminal, type in GET <enter>. The terminal will indicate the parameter that has failed. Enter a valid value for the parameter. Then type WRT <enter> to save it. Type GET <enter> again if no other parameter has failed. The terminal should come back with an OK. If another parameter has failed, that parameter will be displayed. Repeat the above steps until an OK message comes up. Then reboot the CPU.
 - e. The Diagnostic Video Screen message should say "NO-GO" if there is no video board in the card cage.
6. Dial 22 on the DAR board dial switches. LED #1 on the DAR should blink on and off at one second intervals. LED #2 should blink at two second intervals, LED #3 at three second... and so on. If this test fails, verify that J21, J22 and J23 jumpers are present. If test still fails, the problem is most likely a defective DAR board.

7. The + and -15 volt LED should be illuminated on the GVI board.

*Bus
time
check*

8. The 'PT' relay picks-up as long as the Governor, the hoistway safety limit switches, the car safety switches, and the Top of Car Inspection switch circuits are closed. (Note: The front panel switch must be on TEST)
9. The processor will allow the car to function as long as the Normal Power (NP), the SCR Switch (SCRS), the Trip, the Overload, and the GV, HS, CS and ICS inputs are energized.

IV. PRELIMINARY ADJUSTMENTS

CAUTION: All Preliminary adjustments on all the boards must be done with the car NOT moving.

A. GVI Board Preliminary Adjustments

On the GVI board, turn the LT (Linear time) pot fully counterclockwise.

CAUTION: No other pots on the GVI board should be adjusted or be tampered with at this point.

B. DAR Board Preliminary Adjustments

(All clock reference adjustments must be made looking at the DAR board vertically, as it is inserted in the card cage.) On the DAR board, turn the following pots as indicated:

1. AU - Maximum Inspection Velocity Clamp: Turn so the arrow is at 11 o'clock.
2. GL - Maximum Velocity Clamp when doors are open: Turn so the arrow is at 11 o'clock
3. FAULT - Maximum Velocity Clamp during a DAR drivefault: Turn so arrow is at 11 o'clock.
4. Slowdown limit pots SL1 to SL4, depending on the top speed of the elevator, must be adjusted according to Table I (below).

FPM	SL1	SL2	SL3	SL4
200	6 O'CLOCK	-	-	-
250	6 O'CLOCK	-	-	-
300	6 O'CLOCK	-	-	-
350	6 O'CLOCK	-	-	-
400	5 O'CLOCK	7 O'CLOCK	-	-
450	5 O'CLOCK	7 O'CLOCK	-	-
500	4 O'CLOCK	7 O'CLOCK	-	-
600	3 O'CLOCK	6 O'CLOCK	7 O'CLOCK	-
700	3 O'CLOCK	5 O'CLOCK	7 O'CLOCK	-
800	2 O'CLOCK	4 O'CLOCK	6 O'CLOCK	7 O'CLOCK
900	2 O'CLOCK	3 O'CLOCK	5 O'CLOCK	7 O'CLOCK
1000	1 O'CLOCK	3 O'CLOCK	5 O'CLOCK	7 O'CLOCK

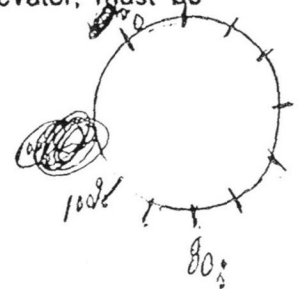


TABLE I

CAUTION: After adjusting the slowdown pots, no other pots on the DAR board should be adjusted or be tampered with at this point.

C. 7PC Regulator Board Preliminary Adjustments

The 7PC board is a part of the Magnetek drive located in the back of the controller. The cover of the DC drive must be removed to get to the 7PC board. On the 7PC turn the following pots as indicated:

1. INT GAIN (73RH): Adjust to 65 percent clockwise. This pot should be in the low range, dip switch 1SS(2) should be in the closed position. *85*
2. PROP GAIN (74RH): Adjust to 45 percent clockwise. This pot should be in the low range. Dip switch 1SS(1) should be in the closed position. *65*
3. TACHVARM (79RH): Adjust to 100 percent clockwise. *(Fault Set) After All Adjustments behind GUI 100*
4. TACH RATE (76RH): Adjust 50 percent clockwise. *100*
5. IR DROOP (77RH): Adjust 50 percent clockwise. *50*

CAUTION: No other pots on the Magnetek DC drive should adjusted or be tampered with at this point.

V. INSPECTION MODE ADJUSTMENT PROCEDURE

A. Tach Voltage Verification *verify DPP also helpful. I done next (E.)*

1. Set the voltmeter for DC voltage and place the positive lead on T+U and the negative lead on T-U terminals.
2. Turn the tach shaft in the direction it will rotate if the car is moving up. The UT (PMI 1-9) input should turn on and the voltage on the meter should be negative.
3. Turn the tach shaft in the direction it will rotate if the car is moving down. The DT (PMI 1-10) input should turn on and the voltage on the meter should be positive.

B. Preliminary Tach Calibration

The initial tach scaling is adjusted by choosing a combination of series connected resistors (1R to 4R) on the Elevator Relay Interface (5PC-1) board. (See APPENDIX D: 5PC-1 Schematic Diagram)

- max tach RPM = $\frac{\text{Sheave Diameter}}{\text{tach wheel D}} \times \text{motor RPM}$*
1. Disconnect tach leads from 1TB(1) and 1TB(2) terminals.
 2. Calculate the required resistance (R) as follows:
 3. (Tach RPM at Contract Speed) X 0.091 = R (kilo-ohms)
 4. Select a resistor series combination on the 5PC-1 board that is closest to but not larger than (R - 35), by connecting jumpers to the appropriate tabs to bypass the resistors not needed. Note that all resistance value are in units of kilo- ohms. Refer to the 5PC-1 Schematic Diagram.
 5. Measure the resistance between 1TB(1) and 1TB(2) terminals and adjust the TACH CAL (75RH) pot on the 7PC to obtain the calculated ohmic value of R. Reconnect the tach leads.

EXAMPLE: For a gearless motor with max RPM of 88 and drive sheave diameter of 36 inches, if the tach wheel diameter is 4 inches and the tach is mounted on the drive sheave:

- Calculate Tach RPM at Contract Speed by $(36/4) \times 88 = 792$
- Multiply $792 \times 0.091 = 72$, $R = 72$ kilo-ohms
- Subtract $72 - 35 = 37$

Therefore, choose resistor 2R and bypass resistors 1R, 3R and 4R. Adjust TACH CAL pot to obtain resistance value of 72 kilo-ohms at 1TB(1) to 1TB(2). Reconnect the tach leads after adjusting the TACH CAL pot.

C. Motor Field Adjustments

- Turn off the main line disconnect to remove power to the Magnetek DC drive and to the motor fields.
- Wait at least 10 seconds for the field current to decay and remove one of the motor field leads either from MF+ or MF-.
- Measure the resistance of the motor fields. It should be the same as indicated in the Motor Field Schematic. If the resistance is different, the motor fields will have to be reconnected either in series or series parallel.
- After all necessary reconnections have been made to the motor fields, turn on the main line disconnect.
- Set voltmeter for DC voltage and place the positive lead on MF+ and the negative lead on MF- terminals.
- On the Field Regulator Board (2EA) close switches 2SS and 3SS. Close 1SS if the rated hoist motor armature voltage is above 250VDC. If it is below 250VDC, keep 1SS open.
- Adjust the MAX FIELD CURRENT (3RH) pot on the Field Regulator Board (2EA) so that the voltage at MF+ to MF- matches the RUN voltage indicated in the Motor Field Schematic.
- Open switch 3SS and adjust the FIELD ECONOMY (5RH) pot on the Field Regulator Board (2EA) so that the voltage at MF+ to MF- matches the STANDBY voltage indicated in the Motor Field Schematic.
- Close the 3SS switch. The motor field volts should increase up to the RUN voltage value. If the increase from STANDBY to RUN occurs at a slow rate, adjust the RESPONSE (4RH) pot to compensate.
- Adjust the CROSSOVER POINT (2RH) pot all the way clockwise.
- With the voltmeter on the DC scale, measure test points 1TP to 3TP on the Field Current Monitor board (place positive lead of the meter on 1TP). Adjust the CALIBRATION (2RH) pot to get -1.0V with full field voltage.
- Open the 3SS switch on the Field Regulator Board (2EA) to get STANDBY voltage. Adjust the TRIP LEVEL (1RH) pot on the Field Current Monitor board until the Field Loss led comes on. Readjust the TRIP LEVEL pot backwards until the LED goes off.

D. DAR, GVI and 7PC Inspection Adjustments

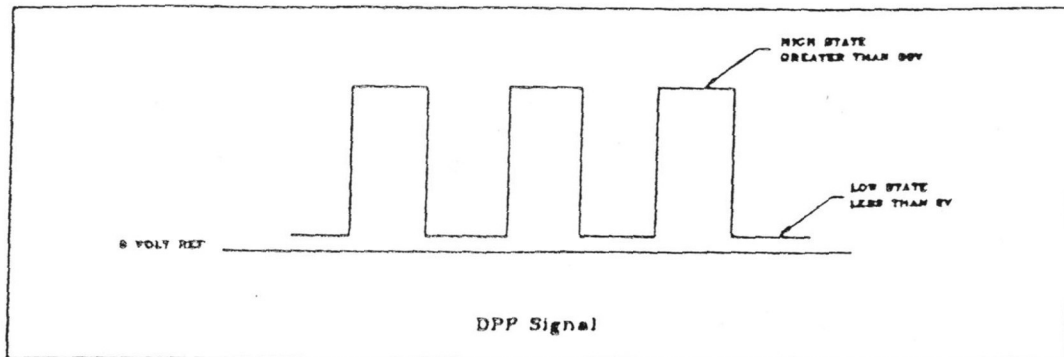
The following adjustment procedure must be done with an empty car.

1. With the diagnostic terminal connected to the CPU, set inspection speed (IVE) to be 10% of contract speed. Place meter leads on R+U and R-U. They are the 1st two pins of the J1 connector on the DAR board. R+U (pin 1) should have the positive (red) lead connected to it.
2. Turn AU pot on the DAR board so the arrow is at 3 o'clock.
3. Run the car up and down on inspection and monitor the DC voltage on the meter.
- 4. In the UP direction adjust DZU parameter to get +0.100 Volts. In the DOWN direction adjust DZD parameter to get -0.100 Volts. When finished, save the values of DZU and DZD by typing in 'WRT' <enter>.
5. Place meter leads at test points 30TP to 63TP on the 7PC board of the Magnetek drive unit. The positive lead should be on 30TP. Run the car up and down on inspection and monitor the DC voltage.
6. Adjust the OFFSET pot on the GVI to equalize the voltages in both direction.
EXAMPLE: If it is -0.9V in the down and +1.0V in the up, adjust OFFSET so it is -0.95V in the down or +0.95 in the up.
7. Adjust the GAIN pot to bring the equal values to +1.00V in the UP direction and -1.00 in the DOWN direction.
8. Run car in either direction and monitor the Diagnostic Video Screen. Adjust the TACH CAL (75RH) pot on the 7PC so that the actual car velocity equals the demand velocity. If the Diagnostic Video Screen is unavailable, dial 29 on the DAR switches. LED's 1 to 16 will indicate the speed difference in 1 to 16 FPM. Adjust TACH CAL (75RH) pot so at most only 2 LED's (FPM) show on the DAR.
9. Set inspection speed to be 0 FPM (IVE=0). Run the car UP and DOWN. The car should hold zero speed for both directions. If the car "DRIFTS", adjust the ZERO TRACKING (80RH) pot on the 7PC to hold zero speed for both directions. (Ignore the first "JUMP" you see as the brake lifts).
10. Run the car on inspection at 20FPM. While the car is moving, type in IVE=0<enter> on the diagnostic terminal. The car should ramp right to zero speed and hold for at least 1/2 second. Try this in both directions. Fine tune the ZERO TRACKING (80RH) as needed.

E. Digital Position Pulse (DPP) Verification

1. Connect voltmeter at pin 8 and pin 7 on the J1 connector of the DAR board.
2. Run the car up and down on inspection at 50FPM. Monitor the DC voltage. It should be between 7.5 to 11.5 VDC.
3. If the voltage is lower than 7.5V, decrease the distance between the DPP sensor and the magnet on the Top of Car Digitizer. If the voltage is higher than 11.5V, increase the distance between the sensor and the magnet.
4. Connect an oscilloscope at pin 8 and pin 7 on the J1 connector of the DAR board.
5. Run the car up and down on inspection at 50FPM. Verify that a square wave is present when the car moves. Also verify that the amplitude of the square wave is correct. (See Figure 1 on the next page.) Note: If an oscilloscope is not available, the above procedure may be bypassed.

FIGURE 1

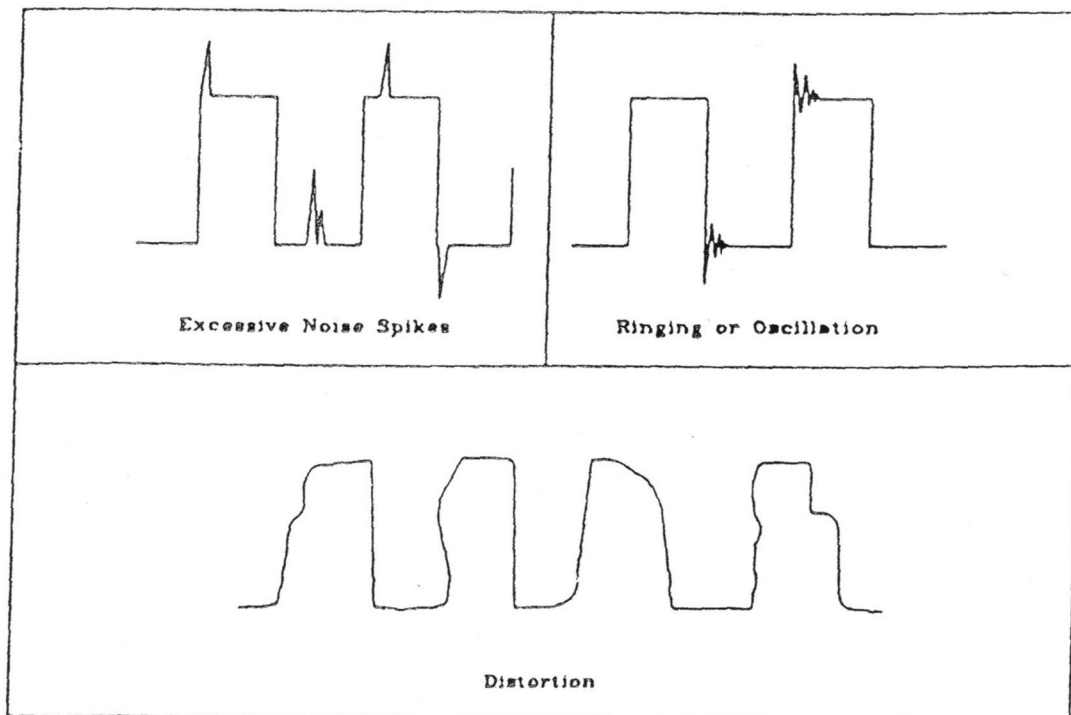


6. Verify that following conditions do NOT exist in reference to the DPP signal:

- a. Excessive noise spikes
- b. Ringing or oscillation
- c. Distortion

(See Figure 2, below, for examples of the above conditions.)

FIGURE 2



7. Do the following if any of the three conditions exist:

- a. Verify that the DPP signal is run through a twisted shielded cable.
- b. Verify that cable shields are grounded only on the controller ground terminal.
- c. Verify that the DPP wiring is not run in the same traveling cable with high voltage signals.
- d. Verify that the minimum wire gauge used for the DPP signal is 20 AWG for a total run of 100 feet or less, or 18 AWG for a total run greater than 100 feet.

VI. AUTOMATIC MODE ADJUSTMENT PROCEDURES

A. Auto Setup

Auto Setup is a procedure in which the CPU learns the position of the terminal limit switches and the floor leveling zones. Therefore the top of car position reader and the leveling magnets must be installed before proceeding with the following steps.

1. Bring the car below the 1st landing so that only the ULZ and LZM leveling inputs are on. ULZ is the Up Leveling and LZM is the Mid Leveling zone input located on PMI #2, I/O positions 13 and 15.
2. With the diagnostic terminal connected to the CPU, set inspection speed to 20FPM and place the processor in Auto Set- Up mode by typing in the ASU command. Once the command is entered, the position count on the diagnostic screen should change to 100.
3. Move the car up on inspection and monitor the position count on the diagnostic screen. As soon as it leaves the 1st landing, the position count should jump to 1000. If it did not jump to 1000, the car was not sufficiently below the 1st landing. Restart Auto Setup from the beginning. Otherwise continue with the following steps.
4. With the UP push button held in and the car still moving up, place a jumper on terminal blocks GL to UN2 and let go of the UP push button. The car should still be moving up at 20FPM. This jumper bypasses the up push button and the up normal switch at the same time.
5. Verify that the position count is increasing and that the DP LED is pulsing on the DAR board. Once the CPU has learned the position of the top floor leveling magnet, the car will stop automatically and the CPU will display the message "Normal Mode" on your diagnostics terminal. If this message is not displayed when the car stops, the top floor magnet was not recognized by the processor. Auto Setup must be redone from the beginning. If the problem persists, contact CEC.
6. Once the computer comes back with the Normal Mode message, save the information by typing in the WRT command. Verify the data that was obtained during Auto Setup. Review the floor position counts by entering the FCP command on the terminal. The 1st landing will always start from a count of 1000. One DPP count is equal to 1/32 of a foot.

EXAMPLE: FCP1=1000 and FCP2=1400, so the distance between 1st and 2nd floors is FCP1-FCP2 which equals 400 DPP. Divide this by 32 to convert to feet, i.e. $400/32=12.5$ ft.

7. The positions of the slowdown limit switches can be verified in the same way. ULR1 will always correspond to the top's most slowdown limit and DLR1 will correspond to the bottom most limit.

EXAMPLE: Suppose that for a 12 floor building FCP12=4250 and ULR1=4085. The distance of the limit from the top floor is $4250-4085=165$, which is $165/32=5.1$ ft.

B. One Floor Run and High Speed Adjustments

1. Place the car on Automatic Service in the middle of the hoistway, with the Door Disc switch in the ON position. The car should level to the nearest floor.
2. Start with a one floor run and then a two floor run in the opposite direction. Continue this procedure and gradually bring the car up to contract speed. Adjust the INT GAIN (73RH)

LEVELING IN

and PROP GAIN (74RH) pots as necessary to eliminate any problem of overshooting when the car levels into a floor. Note: Stay away from terminal landings while adjusting the car.

- Consistent Accel/Decel*
3. Monitor test points 30TP to 63TP on the 7PC with a voltmeter. At contract speed there should be exactly ± 10.0 Volts. If motor voltage and speed is higher than rated, adjust MAX SPEED (78RH) pot counterclockwise. If rated armature voltage and elevator speed cannot be reached, adjust MAX SPEED pot clockwise. Fine tune the high speed with parameters DMU in the up direction and DMD in the down direction. If vibrations are present during high speed, adjust the TACH RATE and IR DROOP pots as necessary.
 4. If the car does not come up to contract speed and armature voltage of the hoist motor is saturated, field weakening (crossover) will have to be implemented. Do the following steps to adjust the crossover point on the Field Regulator board of the Magnetek drive. All steps must be performed while the car is attempting to run at contract speed.
 - a. Using the GAIN pot on the GVI, slowly reduce the speed reference voltage magnitude to obtain 90% of the maximum rated armature voltage.
 - b. Turn Field Regulator CROSSOVER POINT (2RH) pot counterclockwise until the armature voltage drops slightly. Readjust the pot clockwise so the armature voltage goes back to the 90% of rated value.
 - c. Readjust the GAIN pot so that the speed reference voltage is back to ± 10 VDC and adjust the MAX SPEED (78RH) pot to obtain the desired contract speed.
 - d. Monitor the armature voltage and fine tune the CROSSOVER POINT (2RH) pot as required to maintain an armature voltage of 90% of rated.
 - e. Using crossover may cause oscillation of motor field voltage. Adjust the ANTI-HUNT (1RH) pot to compensate.
 5. Once the car is up to contract speed, measure the current and voltage on the hoist motor armature. Make sure they are within name plate ratings.
 6. Connect channel 1 of the oscilloscope to the speed reference, 30TP to 63TP, and channel 2 of the scope to the tach feedback, 71TP to 63TP. Good tracking can be obtained by monitoring and comparing the speed reference to the tach feedback and adjusting the INT GAIN and PROP GAIN pots so that the tach signal closely matches the speed reference signal. If a scope is not available, this can be done by comparing the velocities of the car at the 12" and 2" points in the up and down directions. Adjust the two gain pots so that the speeds in the up closely matches the speeds in the down.
 7. Once good tracking is obtained, adjust your speed dictation curve with the following parameters:
 - a. SST - Soft Start Time: A smaller value makes the car leave quicker. Roll back can be eliminated by adjusting this parameter and delaying the brake to lift by the BDT parameter. Units are in 1/64 of a second. A typical value will range from 12 to 35.
 - b. ACR - Acceleration Rate: Units are Feet/Min/Second. A good value to start with is 160 for gearless and 120 for geared machines. Divide by 60 to convert unit to Feet/Second/Second.
 - c. DER - Deceleration Rate: Units are Feet/Min/Second. A good value to start with is 150 for gearless and 110 for geared machines. DER should be 10 less than ACR.
 - d. LVE - Leveling Velocity: Units are FPM. Good values to start with are 5 to 7.
 - e. RVE - Releveling Velocity: Units are in FPM. Good values to start with are 6 to 8.
 - f. RVT - Roll Velocity for Top Speed: Velocity from top speed in which the transition from acceleration to flat top will start. Units are in FPM. Good values are 20 to 40.

When ever changes are made [wkt] to any set values.

- g. TFD - Transition from Top Speed to Deceleration: Units are in DPP. Four (4) is a good starting value. *Range 1-40*
- h. TLM - Transfer to Leveling Mode: The distance from floor level when the speed curve changes from deceleration to leveling mode. Units are in DPP. A good starting value is 26. *Range 10-50*
- i. DTA - Deceleration Target: Units are in DPP. A good starting value is 21. DTA should never be higher than TLM. *Range 8-40*
- j. TLV - Transfer to Leveling Speed: Units are in DPP. A good starting value is 1. *Range 1-10*

Refer to the Human Interface section of the SWIFT® manual and speed curve diagrams (APPENDIX B & C) for further description of parameters.

8. Adjust the one floor runs by using the following parameters: *A Run where car Does Not Reach High Speed*
- a. PEK - Performance Constant Look Ahead: Raising this value will initiate slowdown earlier. No defined units. A good starting value is 6. *Range 0-31*
- b. ETK - Transition from Acceleration to Deceleration: Controls the roundness of the curve. Raising this value will increase the roundness. No defined units. A good starting value is 2. *Range 0-31*

Refer to the Human Interface section of the SWIFT® manual and speed curve diagrams (APPENDIX B & C) for further description of parameters.

C. Terminal Slowdown Limit Adjustment

1. Preset TSV parameter according to Table II (below). Perform multiple type runs to the terminal landings. Use the ULB command for the top limits and DLB command for the bottom limits to monitor the velocity and position of the car when it hits a slowdown limit switch. Record the highest velocity value per limit. Set TSV parameters 15 greater than the largest recorded velocity. TSV1 corresponds to SLD1 or SLU1. The position data should closely match the values in DLR and ULR, within 2 or 3 DPP's. If not, readjust ULR and DLR parameters with the values obtained in using the ULB and DLB commands. Set LPE parameter to the lowest value possible without causing an error 11. An acceptable value will range from 20 to 30.

FPM	TSV1	TSV2	TSV3	TSV4
200	170	-	-	-
250	220	-	-	-
300	270	-	-	-
350	320	-	-	-
400	320	370	-	-
450	320	420	-	-
500	330	470	-	-
600	330	470	560	-
700	330	510	660	-
800	320	510	660	760
900	330	510	670	860
1000	330	510	670	960

TABLE II

2. The SL1 through SL4 pots must be calibrated accurately. Send the car to the bottom terminal floor. Start with the farthest limit switch and the respective SL pot. Monitor the speed reference (SR to common) with a scope and turn the pot counterclockwise. At the point in which the car hits the slowdown limit, note when clamping of the speed curve starts to occur. Turn the SL pot clockwise until the SR speed ramp is back to a uniform curve. Repeat for each limit and for the top terminal. Do this for all types of runs such as 1 floor, 2 floor, 3 floor and top speed. If a scope cannot be used, monitor SR with an analog meter and note for a slight jump of the needle.

D. Digital and Analog Safety Clamps

1. Analog Safety Clamp Pots

WARNING: All of the following safety clamp pots must be adjusted correctly before placing the car in service.

- a. The F pot controls the DAR fault sensitivity. To adjust this pot correctly the farthest slowdown limit pot (SL) must first be adjusted according to the formula below. This is a temporary adjustment to calibrate the F pot, so be certain to take note of the SL pot's original position.

$$(\text{Velocity of Car at Slowdown Limit} - 150) / \text{Contract Speed of Car} = \text{Percent of Turn}$$

Looking at the SL pot with the DAR vertical, 10 o'clock position represents 0%, 3 o'clock position represents 50%, and 8 o'clock position represents 100%. The velocity of car at slowdown limit can be obtained by using the ULB or DLB commands during a high speed run. Once the SL pot is adjusted, start with the F pot all the way counterclockwise. Repeat the high speed run and start turning the F pot clockwise, one turn at a time. Repeat this procedure until the car drivefaults with an error 23 when it hits the slowdown limit. Repeat the terminal runs and turn pot back counterclockwise 1/4 turn at a time. Continue until the car no longer gives an error 23 when it hits the limit. Readjust SL pot to its original position.

- b. The FAULT pot clamps the speed of the car during a DAR drivefault condition caused by an error 23. Using the above procedures create a drivefault with an error 23. The computer will dictate an emergency slowdown speed. Turn the FAULT pot counterclockwise until the actual car velocity clamps below the dictated emergency velocity. Then turn it back clockwise until the clamping disappears.
- c. The AU is a clamp for the inspection velocity. Run the car on inspection at 100FPM and turn the pot counterclockwise until the actual car velocity clamps below the demand inspection velocity. Turn AU pot clockwise until clamping disappears.
- d. The GL pot is the maximum velocity clamp when doors are open. To adjust this pot, the car must have 12 inch preopening. Adjust this pot with the same procedures used in adjusting the SL pots, except that the clamp on the speed curve signal should be looked for when the doors start to open not when the car hits a limit switch.
- e. The LT pot (Linear Time) located on the GVI is the clamp for the acceleration and deceleration rates. Adjust VEE parameter to the smallest value possible without the car shutting down with an error code 10. Turn the LT pot clockwise 1/5 of a turn and run the car. Repeat this procedure until the car shuts down with a drivefault. Turn LT pot back counterclockwise until the car does not drivefault.
- f. The TACH/VARM (79RH) pot controls the tach fault sensitivity of the Magnetek drive. Adjust to the lowest possible percentage without causing nuisance faults.

2. Fault Detection Parameters and Control Status Bits

WARNING: All of the following fault detection parameters and control status bits must be set before placing the car in service.

- a. VEE is the largest difference allowed between the demand and the actual car velocity computed by the DPP signal. Units are in FPM. Look at the largest velocity difference shown on the diagnostic screen when the car is accelerating and decelerating and add 30. A typical value is 120.
- b. MLV is the maximum velocity the car will be allowed to run with the doors open when leveling. Units are in FPM.
- c. MRV is the maximum velocity the car will be allowed to run with the doors open when releveling. Units are in FPM.
- d. Set panic motion fault bit #3 in Control Status 2 (CS2). A panic motion fault occurs when the velocity error is too large or an out of sequence tach signal or an out of sequence direction signal occurs. When a fault is detected an error 9 is registered and the CPU will immediately shut down the car by removing SYSTEM MASTER (SM) and the directional pilots. The brake will therefore apply immediately. Parameters VDF and TDF must have correct values when this bit is set. Recommended value for both parameters is 14. Refer to the Human Interface section of the SWIFT® manual for a more detailed description of these parameters.
- e. An automatic reset feature for the panic motion fault can be implemented by setting bit #2 in Control Status 2. Note: If the fault occurs more than three times within a hour, it will not continue to reset automatically. After the third time, resetting must be done manually by toggling from AUTO to TEST and back to AUTO.

VII. RUNNING ELEVATOR WITHOUT TOP OF CAR DIGITIZER

During startup it is sometimes necessary to move the car before the installation of the position reader and the DPP tape. Since the CPU requires a DPP feedback signal from the position reader and tape to run the car normally, CEC has given the controller two ways to run on inspection without the Top of Car Digitizer.

WARNING: Before proceeding, it is important to read all the previous sections up to section V.C for the necessary steps to take prior to moving the car.

A. Running the Car with the STM Command

1. Connect the diagnostic terminal to the CPU. The terminal must remain connected during the following steps for the car to move.
2. Turn on the CB1 circuit breaker, the I/O switch and the CPU switch. The panel switch must be on TEST.
3. After the CPU does its System Confidence Test, enter the password and type in 'STM' <enter>. This permits the car to run on inspection without the DPP feedback signal.
4. Set 'IVE' parameter to the desired velocity (FPM) and push the UP or DN button to run the car.

B. Running the Car Without the CPU

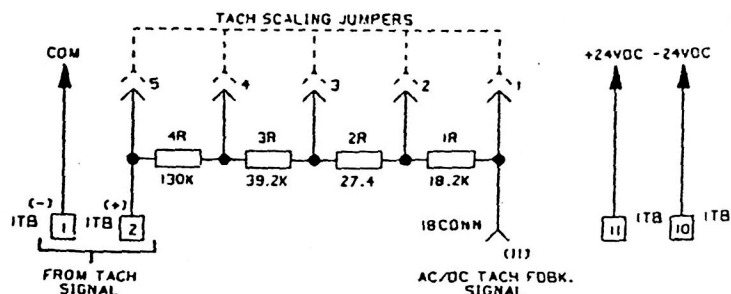
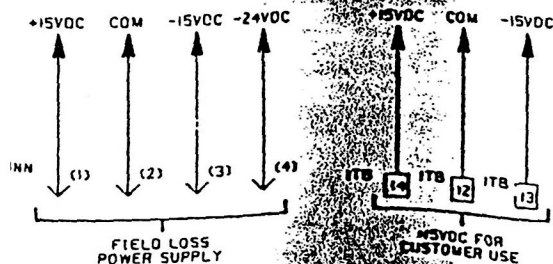
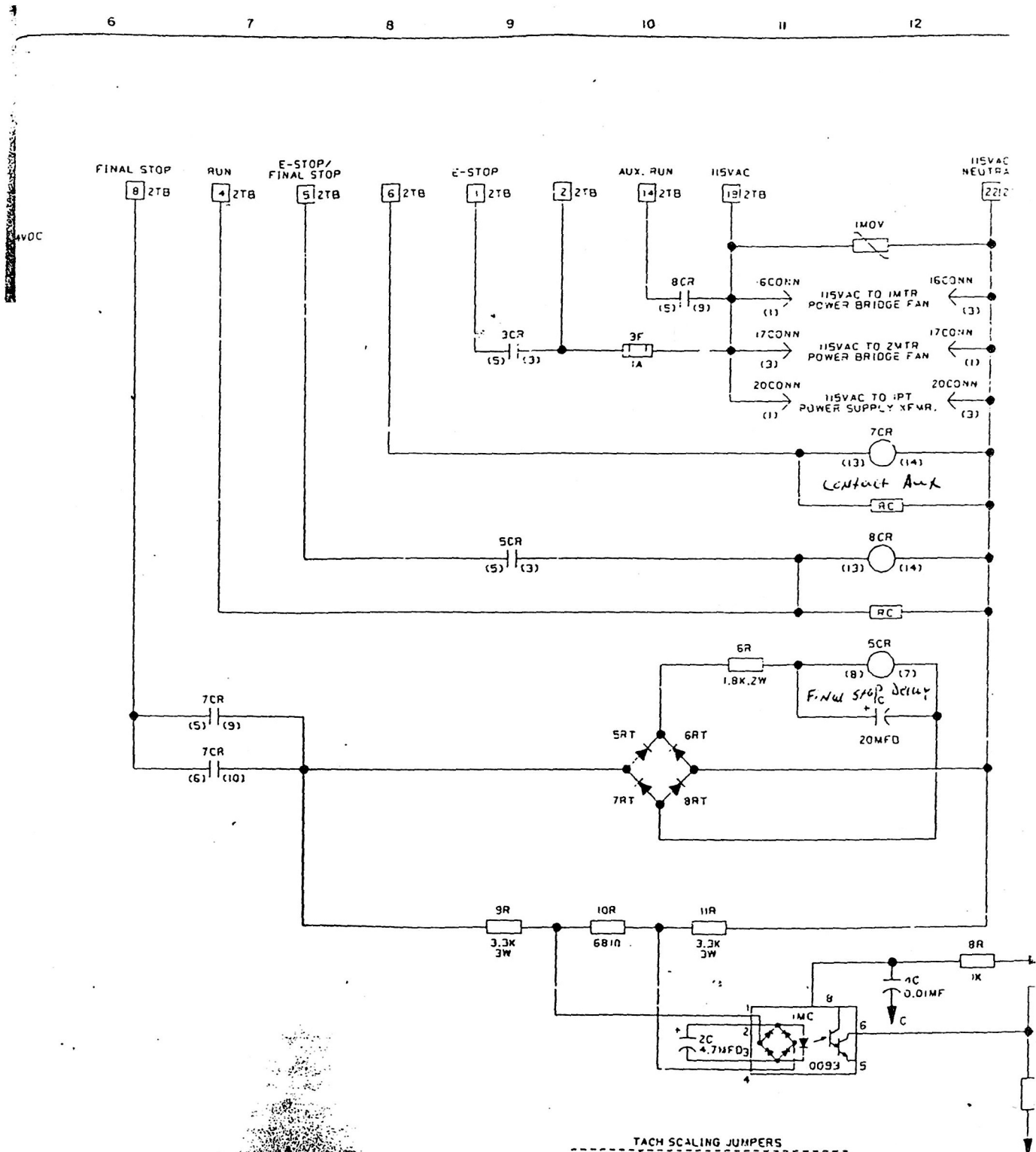
1. Unplug the CPU board from the 1st slot of the card-cage.

2. Turn AU pot on the DAR all the way counterclockwise.
3. The edge connector for PMI #1 must be installed and the PMI board must be inserted in the 3rd slot in the card-cage.
4. Place jumpers on terminal blocks SM to SM1.
5. Turn on the CB1 circuit breaker, the I/O switch and the CPU switch. The panel inspection switch must be on TEST.
6. Push the UP or DN button and slowly turn the AU pot clockwise. The inspection speed of the car will increase the more clockwise the pot is turned. Adjust the AU pot to the desired inspection velocity.

VIII. TROUBLESHOOTING CHECKLIST FOR CAR CONTROLLER

For proper operation of the elevator, whether trying to run on inspection or automatic, the following inputs must be energized in the correct sequence.

1. All slowdown limit inputs must be high if the car is not at a terminal landing.
SD1, SD2 ... SDx
SU1, SU2 ... SUx x = max number of limits.
2. Both Gate and Lock (GL) inputs must be high when the doors are fully closed. One input is located on PMI #1, IO #14 and the other input is on PMI #2, IO #5.
3. The SCR On Off Switch (SCRS) input must be high all the time.
4. The SCR Fault Trip (TRIP) input must be high all the time. The TRIP input is controlled by the 3CR relay from the SCR drive which is energized whenever the drive is in a non-fault condition. Refer to Relay Section 3.
5. All safety inputs must be high all the time. GV, HS, CS and ICS inputs are located on PMI #2 and shown on Relay Section 2.
6. The Overload Fault (OLF) input must be high all the time. The OLF input is controlled by the 2CR relay from the SCR drive which drops out if the SCRs are overheated. Refer to SCR Drive Logic Interface 3.
7. The Normal Power (NP) input must be high all the time. Refer to the Emergency Power print.
8. When a start sequence is initiated either by a call pilot during auto or a directional push button during inspection, the Up Relay (UR) input must come on for the up direction and the Down Relay (DR) input must come on for the down direction. Refer to Relay Section 3.
9. If all of the previous inputs are correctly energized, the controller's CPU will turn on the System Master (SM) output which will energize the DH, MC, BK1 and BK relays. Refer to Relay Section 3. Once this occurs, the CPU will look for the Master Contactor (MC) and the Brake Relay (BK) inputs to turn on immediately before sending out a speed dictation signal to run the car. Refer to Drive Logic Interface 1.
10. As the car starts to move, depending on the direction, the Up Tach (UT) or the Down Tach (DT) input should turn on. Refer to the Drive Logic Interface 1.

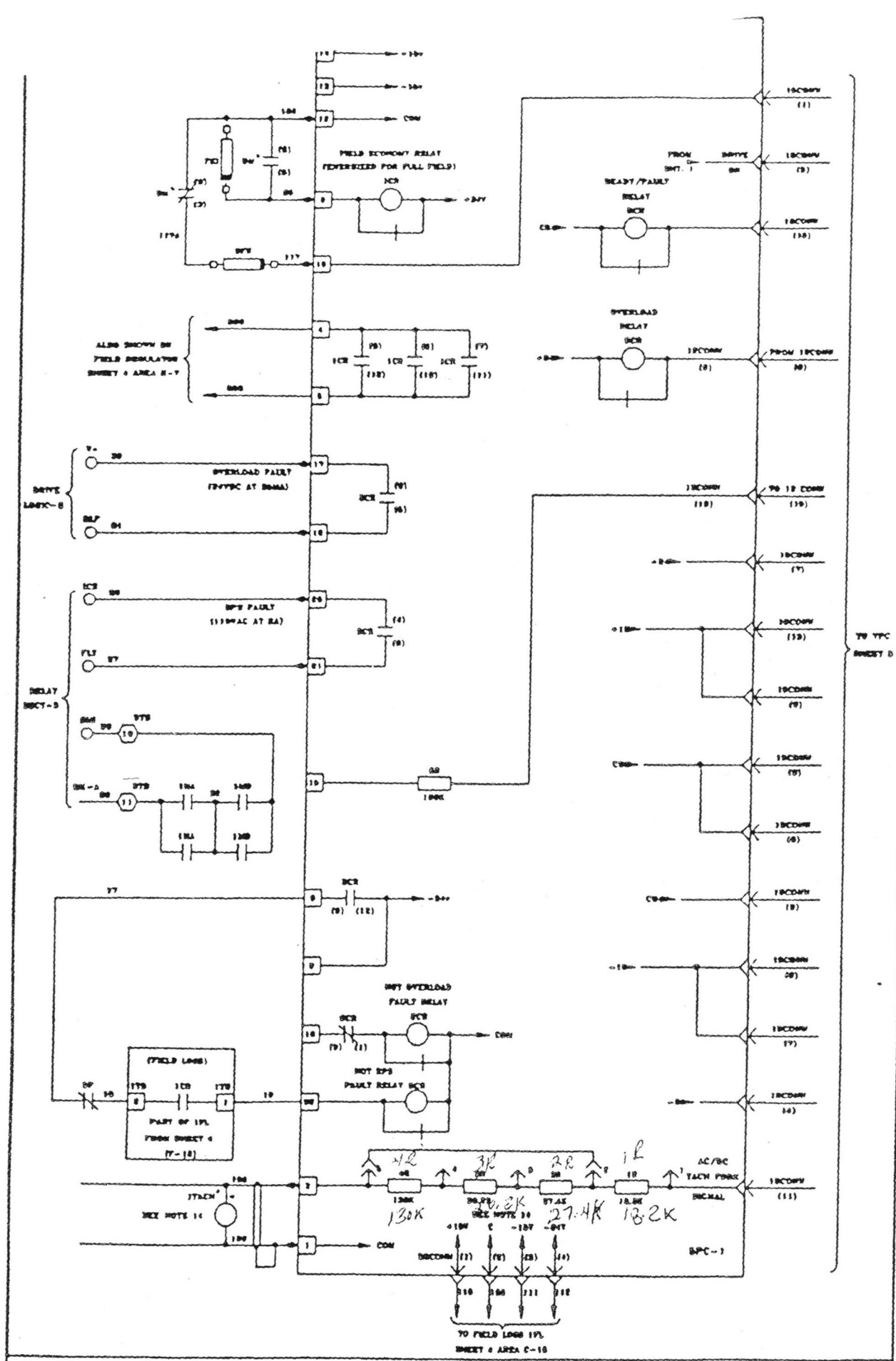


1 "JI" IS FURNISHED ON B/M 465027 (INTERNAL 24VDC SOURCE).
 1 "JI" IS NOT FURNISHED ON B/M 465027 (EXTERNAL 24VDC SOURCE)

REF. 45502740-0010

CHANGES		
NO.	REMARKS	DATE
1	STD-2776	5-28-87
2	STD-2782	6-15-87
3	STD-2835	10-12-87
4	STD-2871	11-12-87
5	STD-3732	9-11-89

REC



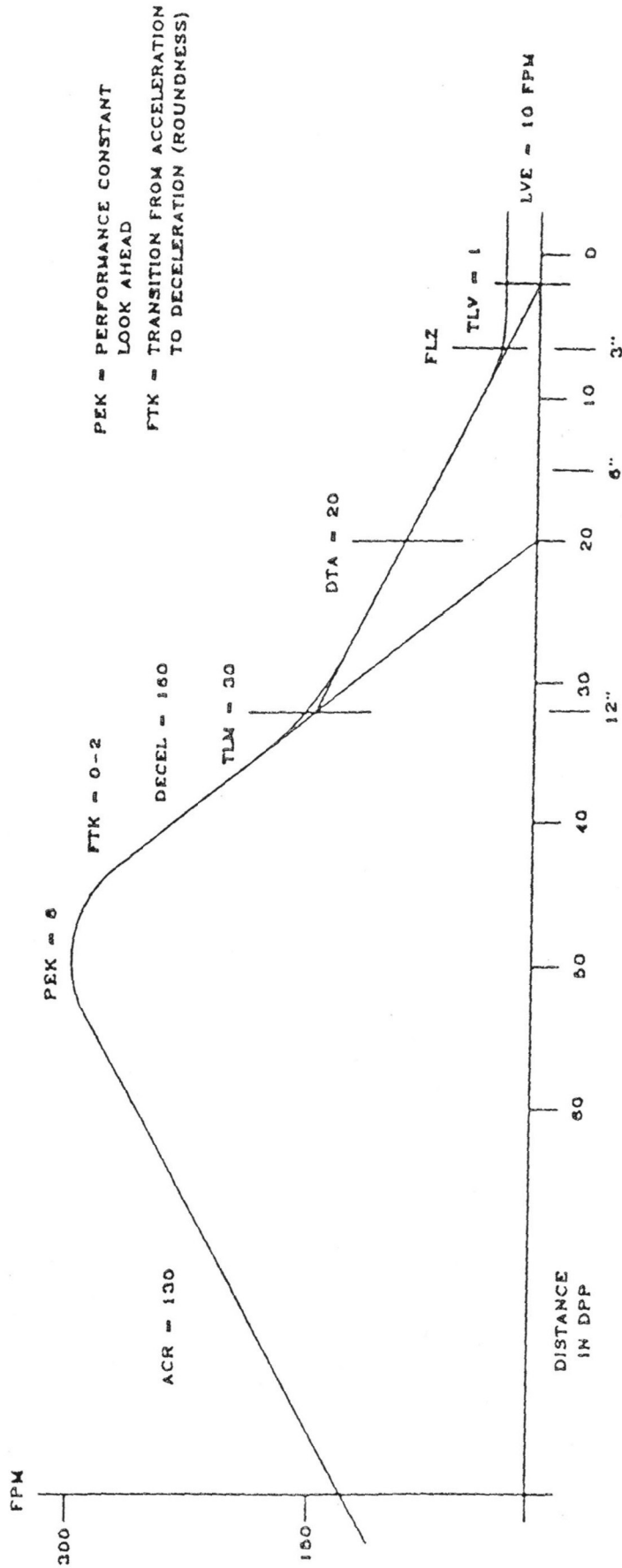
5PC SCHEMATIC DIAGRAM

COMPUTERIZED ELEVATOR CONTROL CORP.			
808 17TH AVENUE NEW YORK, NEW YORK 10008 TEL. (212) 367-8808			
JOB NAME/LOC.:	DATE:	CEC JOB NO.	CAR NO.
DRAWN BY: ST	DWG. NO. 3404-1	REV.	802

SPEED CURVE DIAGRAM #1

APPENDIX B

ONE FLOOR RUN



RECORD CHANGES

NEW YORK ELEVATOR COMPANY
17M AVENUE NEW YORK, NEW YORK 10004 TEL (212) 847-0800

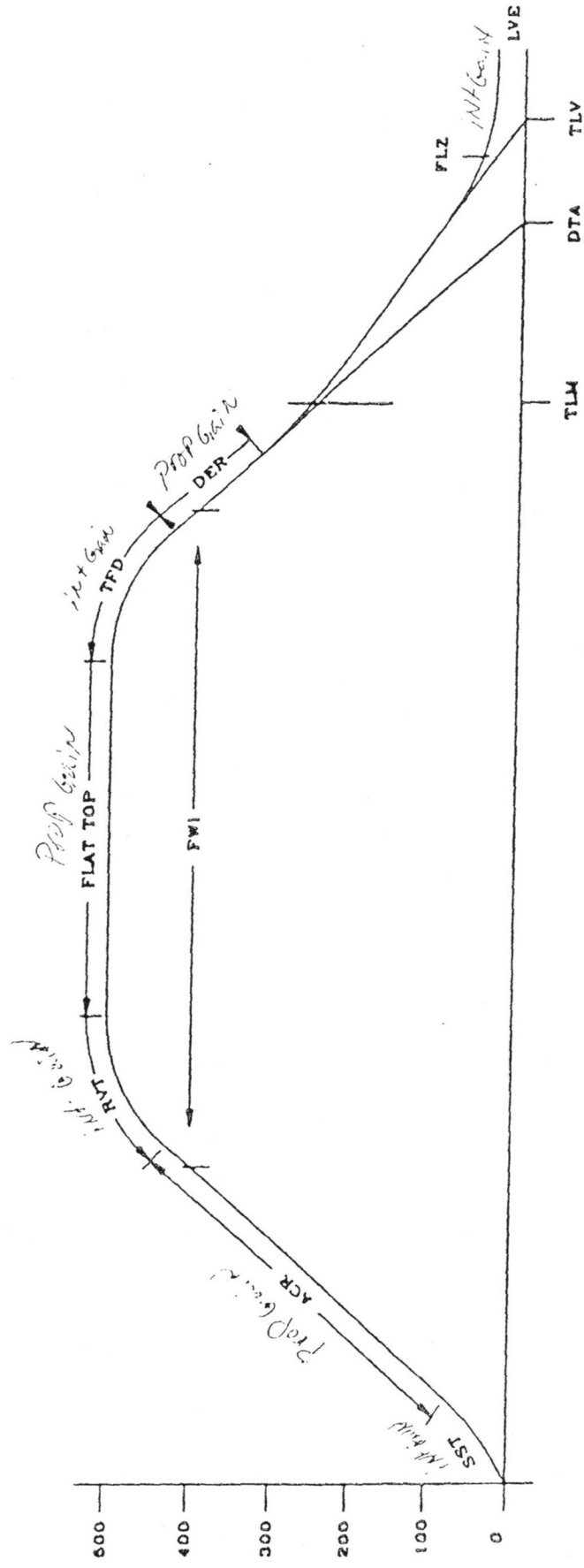
DATE

DATE
JOB NO.

NO. NO. NY100-1

SPEED CURVE DIAGRAM #2

APPENDIX C



LVE = LEVELING VELOCITY
 TLV = TRANSFER TO CONSTANT LEVELING VELOCITY
 FWI = FIELD WEAKENING IN FPM
 FLZ = FINAL LEVELING ZONE FROM TCD (2" TO 3")
 SST = SOFT START
 ACR = ACCELERATION RATE

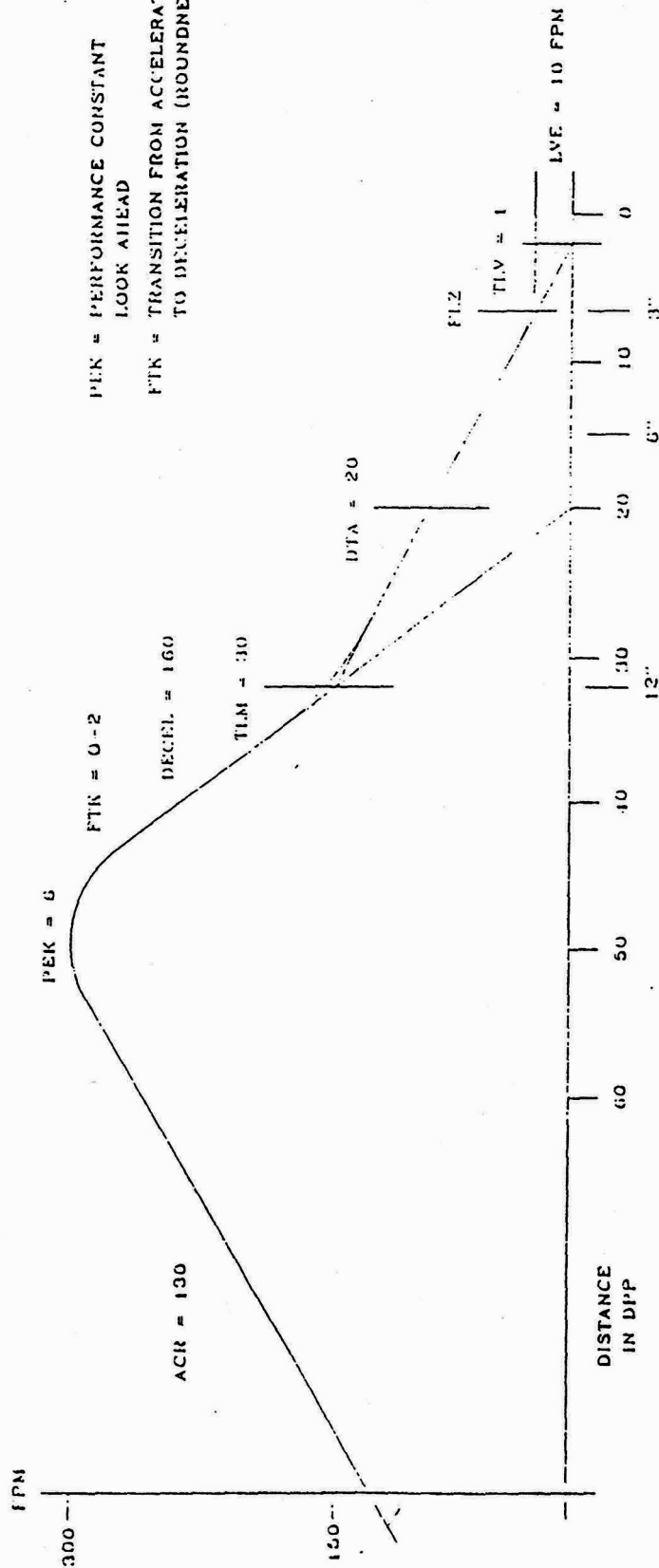
RVT = ROLL VELOCITY FOR TOP SPEED
 TFD = TRANSITION FROM TOP SPEED TO DECELERATION
 DER = DECELERATION RATE
 TLM = TRANSFER TO LEVELING MODE
 DTA = DECELERATION TARGET DISTANCE

NEW YORK ELEVATOR COMPANY		RECORD CHANGES	
117TH AVENUE NEW YORK, NEW YORK 10036 TEL (212) 387-0600		DATE	
NO	DATE		
51100 NO NY01-1	ACR NO		

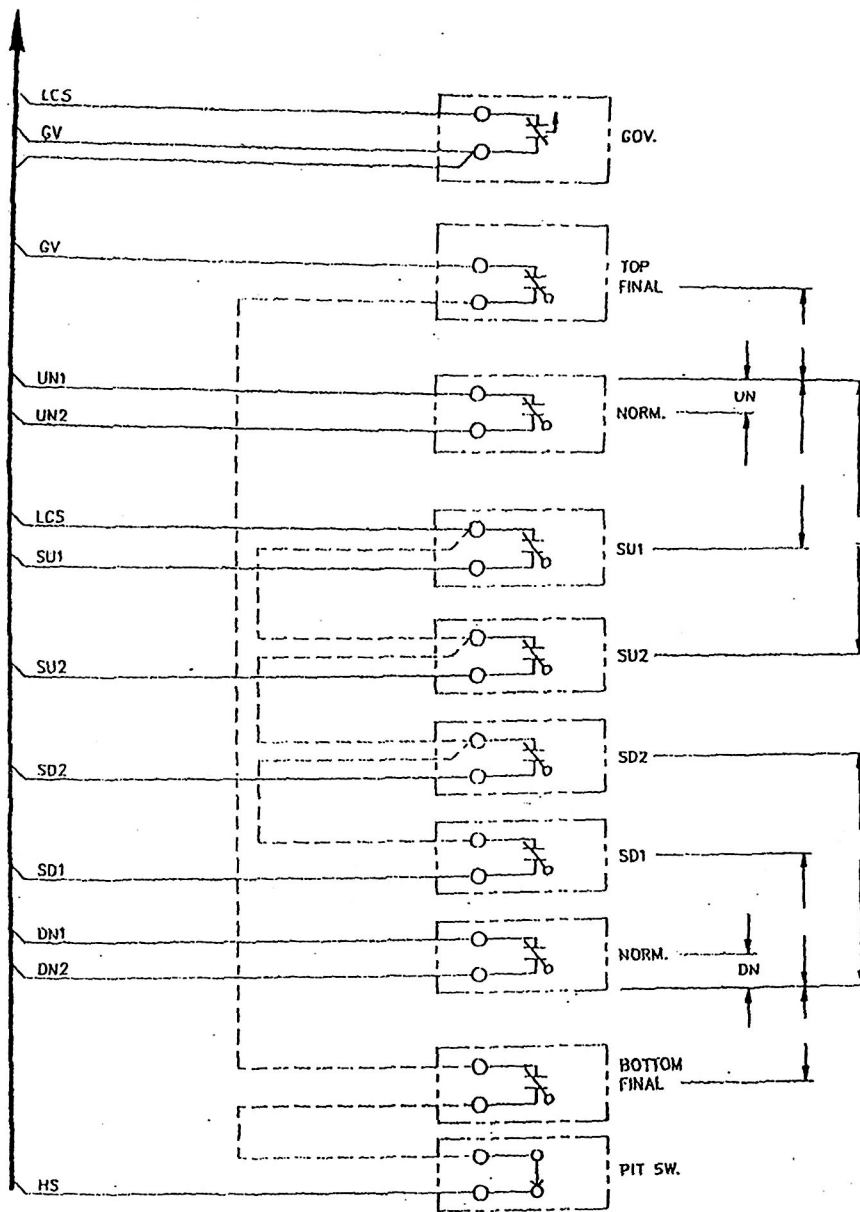
SPEED CURVE DIAGRAM #1

APPENDIX B

ONE FLOOR RUN



NEW YORK ELEVATOR COMPANY		RECORD CHANGES	
438 11TH AVENUE NEW YORK, N.Y. 10018 TEL (212) 397-0400		DATE	
CAD NO	DATE		
DRAWING NO NY100-1	JOIN NO		



HOIST-WAY LIMIT SWITCH

NOTES:

2 LIMITS

COMPUTERIZED ELEVATOR CONTROL CORP.

636 11TH AVENUE NEW YORK, NEW YORK 10036 TEL. (212) 397-0606

JOB NAME/LOC.: US COURTHOUSE -- WASHINGTON, DC

DATE: 09-17-83

CEC JOB NO.: 2365

CAR NO.'s: 1,2,3 & 4

DRAWN BY: NF

DWG. NO.

WD251-3

REV.