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TECHNICAL MANUAL FOR THE MIDIFLITE SYSTEM

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MIDIFLITE

TECHNICAL MANUAL

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INTRODUCTION

This manual contains the application data for **the Midiflite** Microprocessor System for use to assist with system design, and maintenance operations .

The compact **Midiflite** Microprocessor System has been designed to suit a range of low cost lift installations for upto 4 floors of single car (simplex) operation, using Automatic Push Button (APB), Down Collective, and Non-Selective Collective control modes. Special design consideration has been given to realise a cost optimised control system for the ever increasing hydraulic lift market.

The **Midiflite** system uses a **Microprocessor CPU Board**, and a combined **Input / Output** and **Power Supply Board**. This new modular design has a number of advantages, including, much greater noise immunity, and attenuation of supply voltage transients, thereby enabling easy compliance with the current EMC legislation.

The power supply has been designed to give high tolerance to supply fluctuations and provide the necessary filtering to meet modern EMC requirements.

The I /O Board has been designed to provide high noise immunity, and all inputs are fully isolated by opto-couplers. LED indication is provided for each input and output in order to assist fault diagnosis.

The CPU board has been designed to mount above the I / O board and connects to it via a ribbon connector. The CPU board contains the microprocessor control core components such as the microprocessor, EPROM, RAM, the conditioning selection switches, and the fault diagnosis LEDs.

MIDIFLITE CONTROL FEATURES

Standard System Control Features

- Down Collective
- Non-Selective Collective
- A.P.B Control

Power Control Options

- Hydraulic Control
- Variable Frequency Control
- SCR Drive Control
- ACVV Control
- Polechanger / Two Speed Control
- Single Speed Control

Hydraulic System Controls

- Hydraulic Overtravel Sequencing
- Hydraulic Homing
- Hydraulic Relevelling Control
- Hydraulic Vane Sequence Check (via software control)
- Hydraulic YoYo Inhibit
- Hydraulic Star/Delta pump starting control

Door Control Options

- Manual Doors.
- Fully Automatic Doors.
- Swing Landing Doors / Power Car.
- Park Open Control. — Software controlled on request
- Door Nudging — Software controlled on request
- Full Differential Door Dwell Timings.
- Limited Landing Door Reopen

Standard Service Features

- Fire Control
- Service / Goods Control
- 110% Overload
- Emergency Return — Software controlled on request
- Stuck Car / Landing Push Control
- Homing
- Lift In / Out of service indicator

Indicator

- Direction Arrows — On Collective controls only
- Lift Overloaded Indicator
- Lift Out of Service Indicator
- Position Indicators
- Car Call and Landing Call Accepted Indicators

MIDIFLITE CONTROL OPERATING MODES

The **Midiflite** system can support Automatic Push Button (APB), Down Collective, and Non-Selective Collective **modes of control** for call response. The type of control mode must be established at the ordering and program stage of manufacture. There follows a brief description of each type of control mode option.

Automatic Push Button Control (APB)

APB control allows the response of the lift to one call at a time. Once a call is accepted, all other calls are ignored, until the lift stops or opens its' doors, to cancel the accepted call. Car Calls are given a response preference over Landing Calls.

When the lift cancels its call, a timed sequenced preference is established, whereby car calls are given the first opportunity to establish control of the lift, and a time delay later (normally approximately 6 secs.) the landing calls are permitted to establish control if no car call is registered.

APB control is usually used for goods, goods/passenger, and very light duty passenger lifts.

Down Collective Control

Down Collective control allows for the control of Car Calls, and Down Landing Calls.

In general with Down Collective Control, Landing calls are answered when the lift has an established down direction, and by-passed when the lift has an established up direction.

As calls are registered they are stored in the system until they are answered by the lift.

The first call registered will establish a preferred directional preference (either Up or Down).

Car Calls are responded to when the lift has either an UP or a DOWN directional preference.

When the lift is operating with an established UP directional preference, it will respond to the highest Down Landing Call at or above the lift's position, but only when all Car Calls for the established directional preference have been cancelled (other landing calls being stored and by-passed).

When the lift is operating with an established DOWN directional preference it will respond to Down Landing Calls at or below the lift's position.

Down Collective control is generally used where landing traffic above the main floor has a predominantly down flow in applications such as accommodation dwellings, or certain multi-tenancy offices..

Non-Selective Collective Control

Non-Selective Collective control allows for the control of Car Calls, and non-directional Landing Calls..

As calls are registered they are stored in the system until they are answered by the lift.

The first call registered will establish a preferred directional preference (either Up or Down).

Car Calls and Landing Calls are responded to when the lift has either an UP or a DOWN directional preference.

When the lift is operating with an established UP directional preference, it will respond to Car and Landing Call at or above the lift's position.

When the lift is operating with an established DOWN directional preference it will respond to Car and Landing Calls at or below the lift's position.

Non-Selective Collective control is generally used in light duty passenger lifts where traffic flow above the main floor has a two way flow.

MIDIFLITE SERVICES DESCRIPTION

Service Control:-

The Service Control Feature is selected by asserting the **SERV** input signal found on the bottom I/O board. When selected, the service control feature modifies the NORMAL lift control to operate only from the lift car as follows :-

1. Sets the Lift Out of Service / Lift in Service Indicator as appropriate.
2. Inhibits landing call operation.
3. Parks with the doors open until a car call is registered.
4. Door closing operation is modified to be via constant pressure of a car call push (if the call push is released before the doors are fully closed then they will automatically re-open).
5. All registered car calls are cancelled on stopping, or door opening.

Fire Control:-

The Fire Control feature is selected by asserting the **FIRE** input signal found on the bottom I/O board. When selected, the fire control feature returns the lift to the selected Fire Floor and thereafter modifies the NORMAL lift control to operate only from the lift car under a special fireman's control operation as follows :-

1. Sets the Lift Out of Service / Lift in Service Indicator as appropriate.
2. Inhibits landing call operation.
3. Door closing operation is modified to be via constant pressure of a Car Call push (if the call push is released before the doors are fully closed then they will automatically re-open).
4. Door opening operation is modified to be via constant pressure of the Door Open push (if the Door Open push is released before the doors are fully open then the doors reverse to completely close).
5. All registered car calls are cancelled on stopping or door opening.

Load Weighing 110% Overloaded:-

The 110% overload function becomes active when the lift is stationary, and the **LWX** input found on the bottom I/O board is asserted. When the 110% overload is operated, the doors park open, and the **OLI** output is asserted. Car and Landing call maybe entered, but will be cancelled after a short period if the overloaded condition is still true.

MIDIFLITE LIFT IN SERVICE FUNCTIONS

*Lift In Service / Out of Service Indicator:- (**OSI** Output).*

As standard, the Midiflite board will drive an "**OUT OF SERVICE**" indicator, which will only **extinguish** when the lift is deemed to be in full lift service.
When requested the Midiflite board may alternatively drive a "**LIFT IN SERVICE**" indicator, which will **illuminate** when the lift is deemed to be in full lift service.
Full lift service refers to being on NORMAL operation and not Fire control, Service control, Test control, or any other not normal service operation.

Note:- The above paragraph describes two ways of implementing the same output to provide a "Lift in Service" or "Lift Out of Service" indicator as requested by the customer.

Demand Request Operation

The demand feature automatically inserts terminal floor car calls (i.e. Top and Bottom) 120 seconds after lift inactivity following a fault condition, e.g. door open/close protection time, lock failure, failure to start, etc. This cycle will be repeated every 120 seconds up to a maximum of six attempts, or until the lift is back in service. After the sixth attempt, demand request will be inhibited until the system is returned to normal operation via passenger intervention.

MIDIFLITE ANTI-NUISANCE CONTROL

Some Anti-Nuisance features have been included in the **Midiflite** control system, to enhance the operation of the system, and help reduce passenger waiting times. The features described below are all disabled during any not_normal service operations, i.e. Fire and Service control, etc.

Shutdown Control

The **Midiflite** control system will shutdown, and cancel any registered calls when the lift is delayed at a floor for 60 sec. This may be due to faulty door operations, or the failure to start following any demand to move. When Shutdown, and where possible, the doors will be parked open, the out of service indicator will be illuminated, and all car and landing calls will be cancelled. Registration of a car call or landing call will attempt to restore the lift back into service. The Demand Request feature itself will also attempt to restore full lift operation within two minutes.

Doors Held Car Call Dumping

The remaining car calls will be cancelled when the Door Open Push or Safety Edge is held constantly for more than 20 seconds.

Stuck Call Push Detection

A Car Call or Landing Call will be recorded as stuck, 10 seconds after the **Midiflite** board has attempted, and failed, to cancel the call.

The stuck call is now ignored, but will be eligible for operation after the stuck condition has been removed. However, to provide lift service to the floor with the stuck call push, the Midiflite board will reinstate the call (if still stuck), 240 seconds from when originally detected.

MIDIFLITE RELEVELLING SERVICES

The Relevelling feature is included as standard within the **Midiflite** Control System on all hydraulic lift applications.

The **Midiflite** Control System continuously monitors the relevelling operation. If a failure occurs within the relevelling operation, then the relevant fault is recorded and recovery action is initialised.

Features included to enhance the safety associated with relevelling operations are:-

a) Relevelling Sequence

The relevelling sequence is automatically initiated via the **Midiflite** Control System, which can perform relevelling in the up or down direction depending upon operation of the up or down levelling vanes. To prevent the lift from hydraulic oscillations, the relevelling sequence will not be initiated or re-initiated until the lift has been idle for 3 seconds. The **Midiflite** Control System continuously monitors the relevelling operation. If a failure occurs with the relevelling operation then the '**Relev'** fault is recorded, and recovery action is initialised.
Failures associated with relevelling can be categorised as :

1. Proximity switch malfunction.
2. Pump motor malfunction.
3. Hydraulic valve malfunction.
4. Hydraulic pressure malfunction.
5. Control circuit malfunction.

b) Relevelling Time-out Timer

The Hydraulic Relevelling time-out timer will time when the drive system fails to relevel the lift to floor level. This may be caused by failure of the lift hydraulic pump / valve unit, or its associated control circuit. These types of fault will cause the lift to remain in the levelling zone, but not reach floor level within a predictable time limit. This time to reach floor level is set generally to 20 seconds by the **Midiflite** lift program. If the relevelling exceeds this time, the lift is removed from **normal** service, and relevelling operations are suspended. An attempt to return the lift to the bottom floor is then made, since down operation could well be achievable (i.e. no pump motor operation is required). On arrival at the bottom floor the lift will remain **out of service** until the power is switched off.

c) Relevelling Sequence Check. (software).

Normally when the lift stops at floor level it will do so by energising both levelling vanes together. Failure of the levelling vanes to operate correctly will cause the lift to stop by the release of both vanes. This type of operation can be caused by an intermittent malfunction, or by a faulty proximity switch. If the proximity switch operation is unreliable, then the relevelling operation is potentially dangerous. The **Midiflite** microprocessor program monitors the relevelling sequence, and keeps a record of occurrences when the lift stops out of level following a relevel operation. Each time the lift stops out of level a counter is incremented by sixteen. If the lift

makes a successful relevelling operation to stop at floor level the counter is decremented by 1. If the counter reaches a count of 48 (caused by three consecutive relevelling errors, or frequent levelling errors), a **relevel fault** is logged, the lift is removed from service, and relevelling is suspended. Attempts will be made to return the lift to the **bottom** floor, where it will remain **out of service**.

d) Relevelling Safety Sequence Check via Limit Switch or Safety Proven Relays.
The **Midiflite** microprocessor relevelling monitor programme checks the relevelling operation in a non-interlocked way that enhances the safety of the system.
The primary safety of the relevelling operation **must** be controlled, either by, a **safety limit** (with **rip apart contact action**), or multiple channels of redundancy **interlocked safety relays** (see BS5655 Part 2).
For low rise, slow speed, low cost solutions the **safety limit** switch solution is anticipated to be used as standard.
However, the alternative solution of a relevelling monitor board may be used, to check the levelling vane operation during normal journeys, using **interlocked safety relay** methods.
The **safety limit** or **interlocked** relay control methods **cannot** achieve the same sophistication as the **microprocessor** in areas used to assess **reliability**.
The **microprocessor** system **cannot** achieve the absolute **safety interlocking** results achieved by the **limit/interlocked safety relay** monitor.
It is the combination of both systems that are required to give the desired safety, reliability monitoring, and recovery procedures.

e) Hydraulic Anti-YoYo.
During normal relevelling operation excessive relevelling cycles can be detected and recovery action taken. Excessive relevelling cycles can be due to overheating hydraulic oil, faulty hydraulic valve operation, or faulty proximity switches, all of which when left unattended can place the lift in a potentially dangerous condition. The number of relevelling cycles are monitored over a period of minutes. If the number of relevelling cycles is deemed excessive by the **Midiflite** programme, then the relevelling function is suspended and the lift is removed from service. Attempts will be made to return the lift to the **bottom** floor, where it will remain **out of service**.
f) Hydraulic Homing
The **Midiflite** Control System will automatically home to the **lowest** floor level 12 minutes after the last **normal** lift movement. When the main homing floor is not the lowest floor level, the lift will home to the main homing floor after the standard homing time, usually 6 minutes. However the control system will hydraulic home again to the **lowest** level after becoming idle for 12 minutes.Where possible on hydraulic lifts it is recommended that the **homing** floor is the **lowest** level served.

POWER SUPPLY DETAILS

The power supply consists of two supply outputs, 5V DC for the logic and microprocessor operation, and 24V DC for the I/O and indicator operation..
The 5V DC smoothed and stabilised supply, used for the logic and microprocessor operation, is generated on board from a switch mode regulator, which derives its power from a 415/12V AC transformer fitted on the PCB.
The 24V DC capacitor smoothed supply for I/O and indicator operation, derives its supply from 16V AC, sourced from an off board transformer. The combined current capacity of the 24V DC supply is 2 Amps.

POWER SUPPLY CONNECTIONS

415~1	415V AC SUPPLY INPUT FOR CPU & LOGIC CIRCUITS
415~2	415V AC SUPPLY INPUT FOR CPU & LOGIC CIRCUITS
16~1	16V AC SUPPLY FOR INDICATOR & I/O 24V DC SUPPLY CIRCUITS
16~2	16V AC SUPPLY FOR INDICATOR & I/O 24V DC SUPPLY CIRCUITS

MIDIFLITE PSU FUSE ASSIGNMENTS

Fuse	***Size***	*Fuse Function*
5V	**250mA**	Protects CPU transformer 12V AC
24V	**2A**	Protects I/O Transformer 16V AC
PIF	**1A**	Protects Position indicator. 24V DC supply
CAF	**1A**	Protects Car Call indicator 24V DC supply
LAF	**1A**	Protects Landing Call indicator 24V DC supply

MIDIFLITE I / O CONNECTIONS

Terminal	Function	Voltage
LP1 - LP4	LANDING CALL INPUTS (1 - 4)	24V DC
CP1 - CP4	CAR CALL PUSH INPUTS (1 - 4)	24V DC
PXD	PROXIMITY STEPPING DOWN INPUT	24V DC
RSD	SELECTOR RESET (BOTTOM)	24V DC
MSD	LEVELLING PROXIMITY (DOWN)	24V DC
MSU	LEVELLING PROXIMITY (UP)	24V DC
RSU	SELECTOR RESET (TOP)	24V DC
PXU	PROXIMITY STEPPING UP INPUT	24V DC
SERV	SERVICE / GOODS CONTROL INPUT	24V DC
FIRE	FIRE CONTROL INPUT	24V DC
RET	EMERGENCY RECALL SHUTDOWN INPUT	24V DC
SE	SAFE EDGE INPUT	24V DC
DOP	DOOR OPEN PUSH INPUT	24V DC
LWX	OVERLOAD WEIGHT SWITCH INPUT	24V DC
STR	CONTROLLER START FEEDBACK INPUT	24V DC
DO-C	DOORS OPENING / CLOSING INPUT	24V DC
CAF	CAR CALL ACCEPTANCE IND. FEED	24V DC
LAF	LANDING CALL ACCEPTANCE IND FEED	24V DC
PIF	POSITION INDICATOR SUPPLY FEED	24V DC
OVR	O VOLTS RETURN FOR INPUTS & OUTPUTS (INCLUDES CAR AND LANDING PUSH COMMON, AND POSITION IND. COMMON)	24V DC
EMER	TEST CONTROL / EMER. STOP INPUT	240V AC or 110V AC **
LOCK	GATE LOCK INPUT	240V AC or 110V AC **
NG	DOOR NUDGING RELAY OUTPUT	240V AC or 110V AC
DC	DOOR CLOSING RELAY OUTPUT	240V AC or 110V AC
DO	DOOR OPENING RELAY OUTPUT	240V AC or 110V AC
HSR	HIGH SPEED RELAY OUTPUT	240V AC or 110V AC
STAR	STAR HYDRAULIC PUMP RELAY OUTPUT	240V AC or 110V AC
DELTA	DELTA HYDRAULIC PUMP RELAY OUTPUT	240V AC or 110V AC
NX	NEUTRAL RELAY COMMON CONNECTION (COMMON TO STAR,DELTA,DO,DC,HSR,NUG)	
UPR	UP TRAVEL OUTPUT PILOT RELAY	240V AC
DNR	DOWN TRAVEL OUTPUT PILOT RELAY	240V AC
LC	LIVE RELAY COMMON CONNECTION (COMMON TO UPR,DNR)	240V AC
PI1 - PI4	POSITION INDICATOR OUTPUTS 1 TO 4	24V DC
OSI	OUT OF SERVICE / IN SERVICE INDICATOR	24V DC
OLI	LIFT OVERLOADED INDICATOR	24V DC
IU	COMMITTED UP DIRECTION ARROW	24V DC
ID	COMMITTED DOWN DIRECTION ARROW	24V DC

Note:- The Voltage on inputs marked ** are 240V AC or 110V AC depending on model numbers.

MIDIFLITE CPU BOARD

The **Midiflite CPU Board** is fitted above the combined I/O and Power Supply board. It contains the main microprocessor core components, the System Conditioning DIL switches and the Diagnostic indicators.

L.E.D INDICATOR ASSIGNMENTS

Indicator	*Function*
DJT	Journey time fault indicator
WDOG	Watchdog monitor indicator
LOOP	Program running indicator
LOCK	Lock fault indicator
DOOR	Door fault indicator
STFL	Start failure indicator
RELEV	Relevel failure indicator
SLOW	Slowing fault indicator

Note:
Fault indicators will illuminate upon the occurrence of a fault, and will extinguish when the fault is cleared.

DIL SWITCH FUNCTIONS

Switch	*Function*
JT-A	Sets journey time in conjunction with JT-B
JT-B	Sets journey time in conjunction with JT-A
HOM	Homing enable switch
SD-A	Sets Star/Delta pump timer in conjunction with SD-B
SD-B	Sets Star/Delta pump timer in conjunction with SD-A
DW-A	Sets door dwell time in conjunction with DW-B
DW-B	Sets door dwell time in conjunction with DW-A

Notes Referring to the CPU Board Layout *(See page 21).*

The following equipment is worthy of identification on the CPU board :-

- IC3 Z80 microprocessor
- IC4 EPROM containing system program
- IC5 System memory (RAM)

MIDIFLITE DIL SWITCH SETTINGS

JOURNEY TIME

Two DIL switches ‘JT-A’ and ‘JT-B’ offer the following journey time options:-

switch JT-A	*switch JT-B*	*time*
off	off	20 Sec
on	off	30 Sec.
off	on	45 Sec.
on	on	60 Sec.

Note: The journey time is reset each time a selector stepping proximity switch is operated, so the time set is the maximum time between two proximity switch pulses.

HOMING

Operation or the HOM switch to the ON position will enable Homing to the programmed MAIN floor.

STAR / DELTA TIME

Two DIL switches ‘SD-A’ and ‘SD-B’ offer the following Star / Delta pump motor starting time options:-

switch SD-A	*switch SD-B*	*time*
off	off	1 Sec
on	off	2 Sec
off	on	3 Sec
on	on	4 Sec.

DOOR DWELL TIMES

Two DIL switches ‘DW-A’ and ‘DW-B’ offer the following door dwell time options:-

switch DW-A	*switch DW-B*	*time*
off	off	(t) Sec.
on	off	(t+1) Sec
off	on	(t+2) Sec
on	on	(t+3) Sec.

Where (t) identifies the standard Door Dwell time.

<u>*Notes:-*</u> The Standard Door Dwell times are defined as below (i.e. DW-A & DW-B are both set to OFF):-

1)	In Response to a Car & Landing Call	7 Secs
2)	In Response to a Landing Call	5 Secs
3)	In Response to a Car Call	3 Secs
4)	After a Door Open Push Operation	5 Secs
5)	After a Safety Edge Operation	1 Sec

<u>MIDIFLITE FAULT LED FUNCTIONS</u>

LOCK FAULT

If the **Lock** input fails to make following the closing of the doors, or the lock input is opened during **NORMAL** lift operation (not relevelling with open doors), a lock fault is logged. Logging of a Lock Failure illuminates the '**LOCK'** LED on the **CPU** board. The LED remains illuminated until the Lock input makes to clear the fault condition..

DOOR FAULT
If the doors fail to open or close following the appropriate **DOR** or **DCR** demand signal from the microprocessor system, (because of stalled motor, faulty motor, faulty contactor, faulty limit, etc.) then the Door Fault is logged. The logging of a door fault illuminates the '**DOOR'** LED on the **CPU** board. The LED remains illuminated until the doors are successfully closed.

START FAULT
The microprocessor monitors the starting sequence via input **STR** on the I/O board. If the **STR** input does not operate within a short time of the microprocessor issue of a **UPR** or **DNR** start demand then a Start Fault is logged. The logging of a Start Fault illuminates the '**STFL'** LED on the CPU board. The LED remains illuminated until the lift is successfully started.
Many conditions can cause a 'Start Failure' but the common causes are:
a terminal limit not making contact in the shaft
the run contact of a regulator, such as a VVF drive, not making
a phase or thermistor fault (phase failure and reversal unit tripped).
The fault will be generated shortly after the lift has attempted to start.

RELEVEL FAULT
The Relevelling operation is carefully monitored by the microprocessor system (see Relevel Section), and if a malfunction is detected a Relevel Fault is logged. The logging of a Relevelling Fault will illuminate the '**RLEV'** LED on the **CPU** board. Once set the LED will remain illuminated until the Power Supply is switched off.

SLOWING FAULT
The microprocessor monitors the lift during its slowdown and stopping operations. If the lift does not commence a stopping sequence within approximately 15 seconds of slowdown initiation, then a Slowing Fault is logged. The logging of a Slowing Fault illuminates the '**SLOW'** LED on the **CPU** board. Once set the LED will remain illuminated until the lift starts a new journey.

JOURNEY FAULT
The microprocessor monitors the lift while executing its **moving** operation, via the '**STR'** input. If the lift is moving through the shaft, and does not complete its journey, or operate a selector stepping vane, within the setting of the Journey Time (set by DIL Switches JT-A, JT-B), then the Journey Fault is logged. The logging of the Journey Fault illuminates the '**DJT'** LED on the **CPU** board. Once set the LED will remain illuminated until the Power Supply is switched off.

MICROPROCESSOR & CONTROL GEAR SEQUENCING

The microprocessor situated on the CPU board is responsible for the co-ordination of all the inputs / outputs of the surrounding control circuitry via the I / O board.
It is therefore important to be able to understand the sequence of events surrounding the I / O board in conjunction with the external equipment when fault finding.

DOOR CONTROL SEQUENCE

The Door Control sequence is switched from the microprocessor via pilot relays DOR and DCR, to control opening and closing the doors respectively.
Operation of the DOR or DCR pilot relay, will result in the operation of the door control relay DO or DC respectively, and this operation is verified by the microprocessor input DOC. When DOC input is set the microprocessor control will commence sequence functions such as stall protection and lock checking.

NORMAL STARTING SEQUENCE

Assuming the lift is at floor level with the doors closed and ready to accept a call. The Starting Sequence should typically function as described below:

1) A car / landing call is inserted.
2) The microprocessor accepts the call, and outputs a call accepted indicator.
3) The microprocessor will next energises the pilot relays UPR or DNR, (depending upon direction) and HSR. These relays are situated on the I / O board.
4) The microprocessor pilot relays operate to control the main lift controller relays / contactors (UP or DN and HSR).
5) A confirmation of the operation of the drive relays or contactors, via closure of the appropriate relay contacts, is then used to provide a feedback input to the microprocessor at the input STR.

SLOWING AND STOPPING SEQUENCE

Assume the lift is travelling UP in High Speed (+UP,+HSR), and is approaching a floor where a call exists requiring the lift to slow. The Slowing and Stopping Sequence should typically function as described below:

1. The lift will approach the selector stepping vane and increment the selector position to the floor corresponding to the call.
2. When the lift leaves the selector stepping vane HSR relay is released to commence slowdown (on the trailing edge of the vane).
3. The lift will continue to travel to floor level until the next FLD vane is operated to initialise the stopping sequence via the release of UP relay.

SELECTOR OPERATION

A Selector Reset switch is fitted at the Top & Bottom of the lift shaft. If the lift is stationary, or travelling in the appropriate direction, when the corresponding reset limit is operated, then the lift position is reset accordingly to the TOP or BOTTOM floor.
When the lift is travelling in the UP or DOWN direction, the selector position is correspondingly incremented or decremented, under control of the PXU or PXD proximity switch respectively.

SWITCHING ONTO TEST OPERATION FOR THE FIRST TIME

Installation state:-
The Motor, Thermistors, Fan, Valves, and Brake etc. have been connected to the Control Panel.
The safety and lock circuits are in a state where the door contacts, emergency stops etc. are making contact providing continuity from terminals **OTL** to **CTS, CTS to CDC** and from **CDC** to **LDC**.
The wiring has been checked, and all cables are connected correctly.
The fuses are in their correct places, and of the correct size and type.
The lift is switched to **TEST** via the Car Top Control or manually by leaving the connection between **CF** and **TRS** open circuit.
Check there are no obstructions in the lift shaft.
Provisionally set the lift and door motor overloads.
Check that the car and landing doors are closed fully (if fitted at this stage).

The lift can now be switched on

Check the incoming three phase sequence is correct (PFRR relay is energised).
Check the led **EMER** is extinguished, and **LOCK** is illuminated on the bottom I / O board.

The lift can now be driven by making the following temporary connections:-

To travel	UP	=	**TUD** to **TUP**
To travel	DOWN	=	**TUD**to **TDN**

The following checks should be made before continuing with moving the lift :-

1) Check that the Emergency Stop buttons, Locks, and Safety circuit (if applicable), will stop the lift instantaneously shortly after the lift motor starts to rotate.

2) Run the lift and check that the motor (or pump) direction of rotation is correct.

3) Run the lift and check that the brake, ramp, and valve voltages are correct.

4) Check the door operation (if fitted) by using the car top control buttons to make contact between terminals :-

CLOSE	=	**DTF** and **DTC**
OPEN	=	**DTF** and **DTO**

5) Check required selector stepping and levelling switches are in place, and are functional.

6) After Test operation move the lift to the lowest level possible, park with doors closed and switch off the control system.

Note :- If you have any problems at this stage please refer to the fault finding section of this manual.

SWITCHING TO NORMAL OPERATION FOR THE FIRST TIME

Installation state:-

The lift is complete, and is to be operated normally for the first time. The tape head, door operator, Emergency Stop buttons, locks, safety circuit, shaft switches, proximity and levelling signals, have been checked on TEST control as previously instructed and are operating correctly.
The pulsing and levelling signals are in the correct sequence as on the shaft and vane layout drawing.
The lift is at the lowest floor level with the reset signal energised.
The lift is switched onto NORMAL operation via the car top control, i.e. a connection should be made between terminals **CF** and **TRS**, also the lift should not be on any other form of independent service, i.e. Fire or Service control.
Ensure no shaft obstructions exist.

The lift can now be switched on and the following suggested test procedures can be carried out :-

1) Testing the selector stepping and levelling signals (MSU/MSD & PXU/PXD)
This can be achieved by placing calls to each floor in turn in both the UP and DOWN direction, ensuring correct selector stepping and stopping sequence. Correct any problems with the vanes before proceeding to the next stage.
Once correct , run the lift to the terminal floors in both directions to check vane operation.

3) Testing of Terminal limit and Slowing switches
Temporarily inhibit signals PXU,PXD,MSU,MSD (unplug the associated terminal block, or remove the associated terminal block wires, or disable the tapehead via its supply input).
Register a top car call (link 0VR to Cpn) (where n=top floor car call)
The lift is now forced to slow and stop via the terminal slowing and stopping limits.
Register a bottom car call (link 0VR to CP1), and repeat the above process for the down direction.
Replace any connections temporarily removed.

Note:-
If you have any problems at this stage please refer to the fault finding section of this manual.

FAULT FINDING

If the lift system is not working correctly, the service Engineer must find the fault. The Microprocessor ,and its associated circuitry helps the engineer in fault finding by signalling common faults such as door fault, start failure, relevel fault, slowing fault, journey fault (see section regarding *Fault LED Functions*).

When finding a fault on a lift the following checking procedure may assist.

CHECKING PROCEDURE

1) Check the 3 phase incoming supply to the controller.

2) Check motor overloads, circuit breakers, etc.

3) Check the various voltages at the Primary and Secondary of each transformer with respect to their terminals and not earth.

5) Check the voltage going into and out of each fuse on the Microprocessor Power Supply, and in the control panel, making sure they are the correct type, and visually inspect where possible for a blown fuse (avoid switching off if possible to check fuses as this may clear the problem, but it may return at a later date causing another callout).

6) LED **EMER** = Safety Circuit should be lit on the I/O Board, if not check live feeds in order to terminals **CF, OTL, RWS, OS, SGS and CTS.**

7) LED **LOCK** = Lock Circuit Should be lit on the I/O Board when the doors are shut, if not check live feeds in order to terminals **CDC** and **LDC**.

8) Check that the following functions are NOT switched on, and the LEDs are not illuminated:- *(see descriptions of the service features)*

a) **OSI**, out of service indicator
b) **LWX & OLI**, illuminated when the lift is 110% overloaded.
c) **RET**, illuminated when on Emergency Recall/Shutdown.
d) **SERV**, illuminated when on Service control.
e) **FIRE**, illuminated when on Fire Control.
f) **SE, DOP**, are illuminated when the Safe edge, or Door Open Button are activated, which may prevent the doors from closing.
g) Check the phase failure and reversal relay (**PFRR**) is operated.

If all circuits appear to be O.K, there is a possibility of a circuit, or coil fault on a relay, contactor, brake, ramp, or a hydraulic valve solenoid.
If further help is required whilst fault finding please make a note of the following before contacting ILE.

i) LED's that are illuminated.
ii) A full report of the state of the contactors and relays etc.
iii) A full report of the lift fault.

COMMON FAULTS ON THE LIFT SYSTEM

A) Lift car out of step with the controller

i) When car stops at floor level both MSU and MSD must be illuminated.
ii) Proximity input PXU/PXD must pulse on and off between every floor.
iii) Check Tapehead unit/floor selection switches operate correctly.
iv) Check car/landing calls are being entered to the correct floors.

B) Doors remain open and will not close

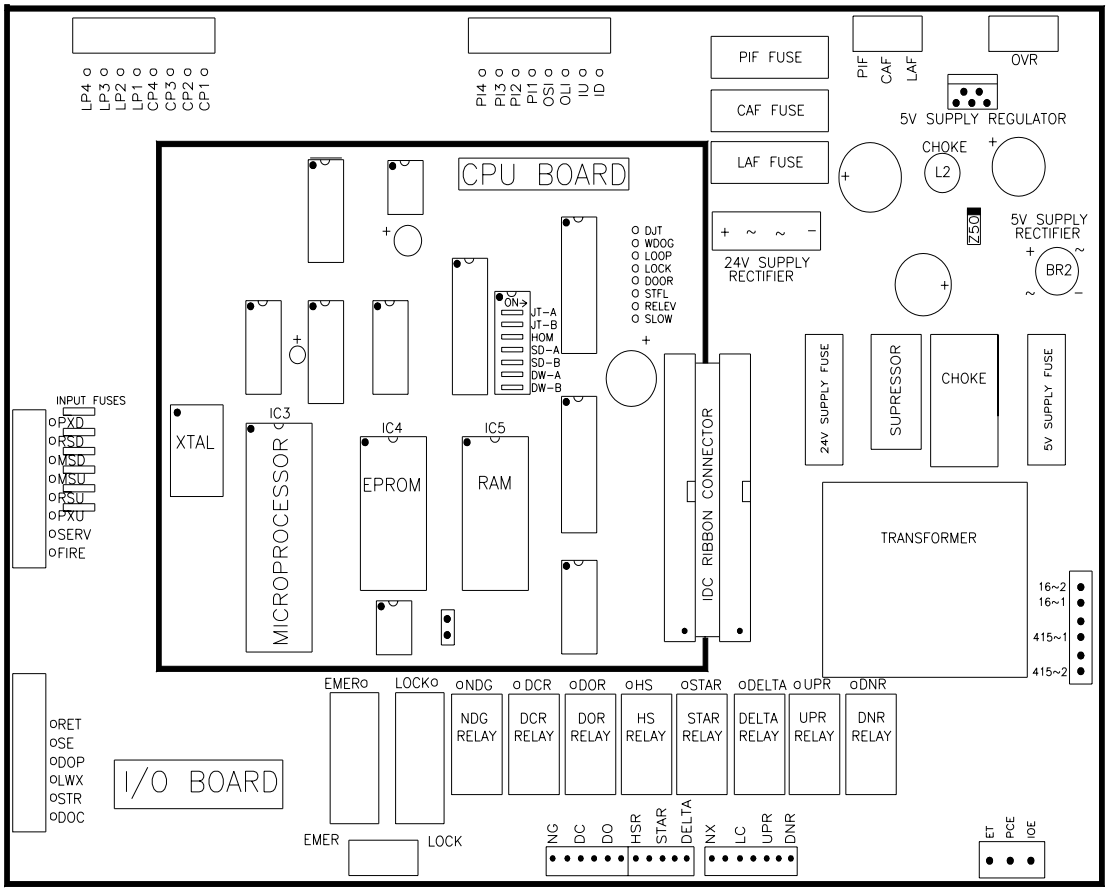
i) Check safe edge, door open button, photocells are not operated.
ii) Check door open and close limits have correctly operated.
iii) Check Terminal limits (including reset limits).
iv) Check the lift is not 90% or 110% overloaded,
v) Note:- Under 90% overload condition the doors maybe closed under opertion of a car call.
. vi) Note:- under Fire control, Service control the lift doors park open, and will only close by a constant pressure car call.

C) Doors closed lift will not run

i) Check car and landing locks are made (LEDs **EMER** and **LOCK** on the I /O board).
ii) Check door limits.
iii) Check shaft Terminal limits.
iv) Check the STR feedback into microprocessor input.

D) Lift stops in travel

I) Lock tipped.
ii) Journey timer operated.
iii) Slowing switch incorrectly set.
iv) Lift slowed and stopped in mid travel, Tapehead / Proximity switch malfunctioning or set incorrectly.
v) Speed regulator fault.
vi) Phase faulty (also phase failure).



MIDIFLITE BOARD LAYOUT

AFTER SALES SERVICE

1) Aim

It is the aim of International Lift Equipment to provide an After Sales Service which is to the complete satisfaction of our customers.

2) Spares

We will endeavour to despatch within 24 hours of your written or verbal order, received during normal working hours.

Despatch and receipt for the spares ordered, will be dependant on the delivery requested, (letter post, parcel post, datapost, red star, overnight or any other you require).

3) Telephone / Telefax Support

We are available to offer support over the telephone / telefax at anytime during office hours, 0830 - 1300 and 1400 - 1700.

4) Commissioning and Assistance on site

We are available to assist with the commissioning of the lift on site, or give help and advice regarding the lift on site.
Non guarantee visits may be charged, please check if in doubt.

5) Customer Training

It is our aim to ensure that all lift engineers are fully conversant with the Midiflite lift controllers and we will carry out **training courses** at Blaby-Leicester to suit the level of training required.

6) Systems Standard

The **Midiflite** controllers are suitable for all types of lifts and therefore can be adopted as a systems standard.

If the PCB's are damaged during installation by mechanical damage, humidity, incorrect connections and/or incorrect voltages being connected, ***THE GUARANTEE IS VOID.***

AFTER SALES TECHNICAL SUPPORT

ILE LONDON SALES OFFICE

Units 1 & 2
Highams Park Industrial Estate
Larkshall Road
LONDON
E4 7HS

Telephone (0181) 527 9669
Telefax (0181) 531 0936

(For the sale of all lift equipment)

1) General
All quotations are made and orders are accepted subject to the following terms.

2) Validity of quotations
All quotations are valid for 30 days from the date of tender. We reserve the right to refuse your acceptance of a quotation.

3) Prices
We reserve the right to 'invoice at the time of despatch' if the delivery of the equipment is delayed beyond a reasonable time.

4) Acceptance
The placing of an order must be accompanied by sufficient information to enable us to proceed, otherwise we shall be at liberty to amend the price to cover any increases in cost and also amend the delivery date resulting from such delays.
Technical information must be supplied (if requested) to enable the manufacture of the system to be carried out.
Information received will be used and we accept no responsibility for errors caused by others.

5) Despatch
All despatch times are estimates only and we will endeavour to despatch the equipment to suit your requirements whenever possible. We will not be liable for failure to despatch on time.

6) Delivery
Prices are quoted 'ex woks' and delivery costs will be charged as an extra.

7) Guarantee
All controllers are guaranteed for 12 months from the date of delivery.

8) Faulty Equipment
The guarantee covers replacement of the faulty part only and no other liability.

9) Health and Safety at Work
The equipment is designed and manufactured in accordance with accepted International and British standards. It is also designed and manufactured to be safe without risk to health (as far as is reasonably practicable) when properly used.
It is the obligation of the purchaser to ensure that the equipment is correctly installed, commissioned, operated and maintained by competent persons.

ALSO SEE THE ILE STANDARD CONDITIONS OF SALE