SIMPLEX

FIRE INDICATOR PANEL

TYPE 4020

TECHNICAL MANUAL

Document No:004-096 October 1992 Issue 1.0

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MANUFACTURERS DETAILS

APPROVALS: AUSTRALIAN STANDARDS AS1603.4
SSL CERTIFICATE OF COMPLIANCE NUMBER:197

The 4020 Fire Indicator Panel is manufactured by:

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Notice: The contents of this document is subject to change without notice.

CONTENTS PAGE

AMENDMENTS TO 4020 TECHNICAL MANUAL

ISSUE	SECTION/PAGES AMENDED	DATE AMENDED	COMMENTS	ECN No.
1	NIL	1-10-92	Original	

1 INTRODUCTION

This manual provides information for the personnel engaged in the commissioning and maintenance of the 4020 FIP and is to be used inconjunction with the 4020 Operators Manual.

It is assumed that users of this manual are:

(a) Familiar with the operation of the 4020 FIP.

(b) Trained to install and service microprocessor based fire alarm equipment

1.1 ASSOCIATED DOCUMENTATION

1.1.1 SIMPLEX AUSTRALIA

The following additional documents are available from Simplex Australia:

Document No: 001-979 - 4020 Operating Manual.

1.1.2 STANDARDS ASSOCIATION OF AUSTRALIA

This manual makes reference to the following Australian Standards:

AS1603.4 Automatic Fire Detection and Alarm Systems Part 4 - Control and Indicating Equipment.

AS1670 Automatic Fire Detection and Alarm Systems - System Design, Installation and Commissioning.

1.2 TERMINOLOGY

ACF	Ancillary Control Facility
AZF	Alarm Zone Facility
CPU	Central Processing Unit
E^2PROM	Electrically Erasable Programmable Read Only Memory
EPROM	Erasable Programmable Read Only Memory
FIP	Fire Indicating Panel
IC	Integrated Circuit
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MCU	MicroController Unit
N.O.	Normally Open Relay contact
N.C.	Normally closed Relay contact
PCB	Printed Circuit Board
PSU	Power Supply Unit
RAM	Random Access Memory
ROM	Read Only Memory

2 PANEL DESCRIPTION

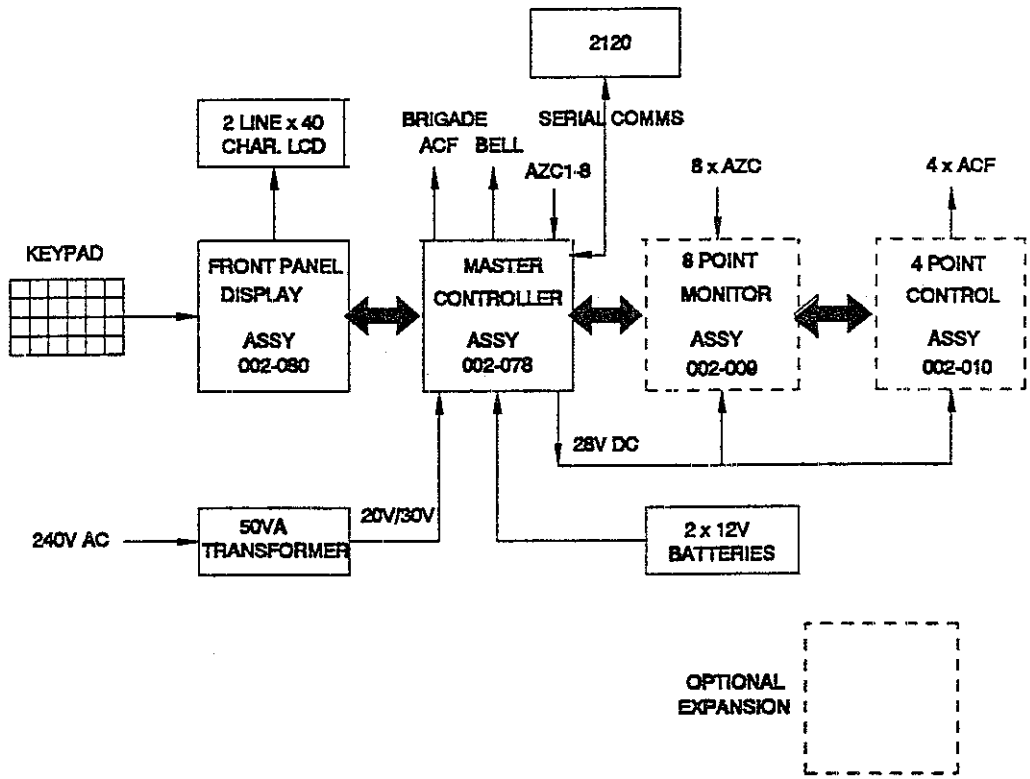
2.1 SYSTEM OVERVIEW

The 4020 Fire Indicating Panel is a microprocessor based Fire Detection and Alarm System designed in accordance with the requirements of Australian Standard AS1603.4 for Automatic Fire Detection and Alarm Systems.

The 4020 FIP can monitor up to forty eight different fire detection zones comprising of alarm actuating devices such as conventional smoke and heat detectors, manual call points, pressure switches, duct detectors and flow switches.

The 4020 also provides Ancillary Control Facilities such as alarm bell, brigade interface relays, A/C shutdown and door holder controls which are operated upon receipt of an alarm in accordance with a programmed set of alarm conditions. The 4020 is fully field programmable through the front panel keyboard enabling it to be custom programmed to meet a variety of fire detection applications. The custom program is stored in non-volatile memory which prevents it contents being lost even in the event of total power loss.

Figure 2.1 - 4020 System Block Diagram



In its basic configuration, the 4020 FIP comprises of the following modules:

(1) Master Controller Module - Assy No. 002-078

(2) Front Panel Display Module - Assy No. 002-080

These two modules provide all the functions for an 8 zone fire indicating panel including a supervised alarm bell output and Fire Brigade Interface relays.
If further capacity is required above the basic 8 zones or if additional Ancillary Control Outputs are required then the following expansion modules can be added to the system:

(1) 8 Point Alarm Zone Monitor Module - Assy No. 002-009

(2) 4 Point Ancillary Control Module - Assy No. 002-010

A maximum of up to five additional expansion modules can be added and can comprise of any combination of the above two expansion modules. Figure 2.1 represents a block diagram of the 4020 FIP.

2.2 SPECIFICATIONS

2.2.1 GENERAL

System Capacity	Minimum 8 Alarm Zone Circuits Maximum 48 Alarm Zone Circuits
Cabinet Size(mm)	440H x 500W x 140D
Cabinet Material	1.5mm Mild grade steel
Cabinet Finish	Powder coated
Cabinet Colour	Magnolia Ripple
Mounting	Wall mount
Shipping Weight	14Kg (without batteries)
Mains Input	240V AC, +6%,-10%,50Hz
Internal Power Supply	24V DC @ 1.5A,
Standby Battery	24V sealed lead acid 7Ah or 12Ah
Battery Charger	27.6V DC (nominal) @ 0.6A,
PSU Supervision	Charger high/low,Battery low/fail
Temperature	-5°C to 45°C
Humidity	10% to 90% rh non-condensing.

2.2.2 INPUTS

Detector Circuits	Standard 20V detectors
Maximum detector quiescent current	2.4mA
Door Switch	Bell Isolate, ACF Isolate
Other	Supervised door mounted Manual Call Point

2.2.3 OUTPUTS

Bell	Supervised 24V DC @ 1.5A
Brigade(2)	Voltage free relay contacts (2A @ 30V dc) N.O. or N.C. Power Fail(Fault),Master Alarm
Ancillary(2)	Voltage free relay contacts (2A @ 30V dc) N.O. or N.C.

2.2.4 INDICATORS AND DISPLAY

Zone Status	2 line by 40 character backlight Liquid Crystal Display with adjustable contrast control
LED Status Indicators	Common Alarm, Fault and Isolate Bell Isolated, ACF Isolated, Mains Power ON
Audible Buzzer	Alarm And Fault Indications Keypress feedback

SPECIFICATION (CONTINUED)

2.2.5 KEYPAD CONTROLS

Fire Fighters Keypad	NEXT, ACKNOWLEDGE, RESET, ISOLATE, BRIGADE TEST
Service Technician Keypad	20 keys including:- Alarm Test, Fault Test, Isolate, Battery Test and Lamp test

2.2.6 PROGRAMMING FUNCTION

Input Zone Type	Normal, Alarm Verification, AS1668 - 30sec or 60 sec, Latching/non-latching
Zone Labels	Maximum 27 characters
OutPut Control	Input list conditions, delay time, Door Isolate

2.2.7 COMMUNICATIONS PORT

Communications Port	Serial, RS232

2.2.8 EXPANSION CARDS

8 Input Monitor Card	8 alarm zone circuits
4 Point Control Card	4 x N.O. Voltage free relay contacts(2A @ 30V dc) supervised/unsupervised
Maximum Number	5

2.2.9 COMPATIBLE ACTUATING DEVICES

The following detectors have been approved as compatible devices for use with the 4020 FIP.

1) HOCHIKI RANGE:

DCA-B-60R MK V	Type A heat detector
DFE-60B	Type B heat detector
DCA-B-90R MK 1	Type C heat detector
DFE-90D	Type D heat detector
DFG-60BLKJ	Type B heat detector
SPA-AB	Beam type smoke detector
SIH-AM	Ionisation smoke detector
SLK-A	Photoelectric smoke detector
SLG-AM MK 1	Photoelectric smoke detector
HF-24A MK 1	Ultraviolet smoke detector
YBC-R/3A	Plain - non indicating base
YBF-RL/4AH4	LED Indicating base

2) OLSEN RANGE:

B111B	Beam type smoke detector
C24B	Ionisation smoke detector
C29B	Ionisation smoke detector
FW81B	Heat detector cable
P24B	Photoelectric smoke detector
P29B	Photoelectric smoke detector
R24B	Dual spectrum infrared flame detector
T54B	Probe type heat detector type E
T56B	Heat detector types A,B,C,D with Z55B base
T56B	Heat detector types A,B,C,D with Z54B base
V41B/V42B	Ultraviolet flame detector

3) PANASONIC RANGE:

PFS-A	Type A heat detector
PFS-B	Type B heat detector
PFS-C	Type C heat detector
PFS-D	Type D heat detector
PFS-P	Photoelectric smoke detector
PFS-I	Ionisation smoke detector

2.2.10 COMPATIBLE BATTERIES

The following series of batteries are compatible with the 4020 FIP :

(1) Power-Sonic PS12 series

(2) Sonnenschien A200 series

(3) Sonnenschien A300 series

(4) Yuasa NP series

2.3 PANEL DESCRIPTION

All the components of the 4020 FIP are housed in a single enclosure as shown in figure 2.2 and comprise of the following modules:

(1) Master Controller Module - Assy No. 002-078

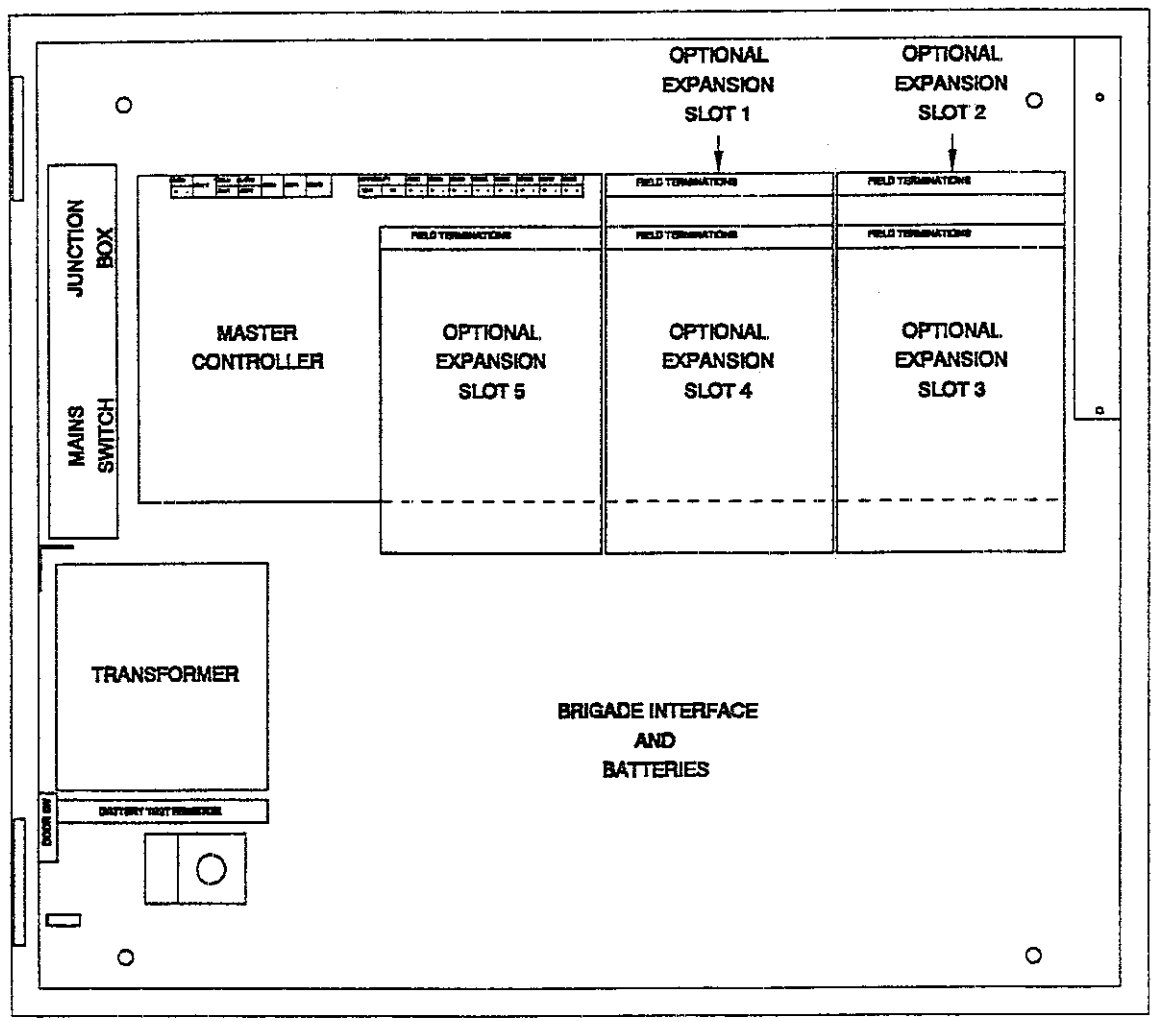
(2) Front Panel Display Module - Assy No. 002-080

(3) Optional 8 Point Alarm Zone Monitor Module - Assy No. 002-009

(4) Optional 4 Point Ancillary Control Module - Assy No. 002-010

An expansion chassis plate can be located over the existing expansion cards to provide space for an additional three more expansion modules bringing the total system capacity to five expansion cards.

FIG 2.2 4020 INTERNAL LAYOUT



The following summarises the function of each module:

The *Master Controller Board* is the heart of the 4020 system and contains the all the elements for an 8 zone fire indicating panel. System expansion is provided by connecting additional Alarm Zone or Ancillary Control cards to the expansion control bus.The Master Controller provides system control, synchronisation and supervision of all connected circuits.

The *LCD Display Board* functions as a terminal for displaying panel status information transmitted from the master controller as formatted message display strings.This is then displayed on a 40 character by 2 line Liquid Crystal Display. Front panel keypress information is transmitted serially from the LCD display board to the master control board for actioning.
The LCD display board is connected to the master controller via a 14 way ribbon connector which provides the physical link for 24V power bus and serial communications bus. The connection is supervised and a fault condition is annunciated on the LCD display in the event of a loss of communications to the Master Controller board.

The *8 Point Monitor Board* Assy. No. 002-009, it is designed to interface with Alarm Actuating Devices such as Smoke and Heat detectors, Manual Call Points, Pressure Switches etc.
This card provides alarm zone expansion above the basic 8 zones contained on the Master Controller Module. Zone expansion is in groups of 8 zones with a maximum limit of five 8 point Monitor cards or 40 additional zones.
The card connects to the Master Controller via an expansion bus interface providing data, test and reference signals.

The *4 Point Control Card* Assy.No. 002-010 provides additional ancillary control outputs above the four outputs contained on the Master Controller Board. Each card contains 4 supervised or non-supervised 2 amp relay control points with a single pole Normally Open contact.

3 MASTER CONTROLLER MODULE

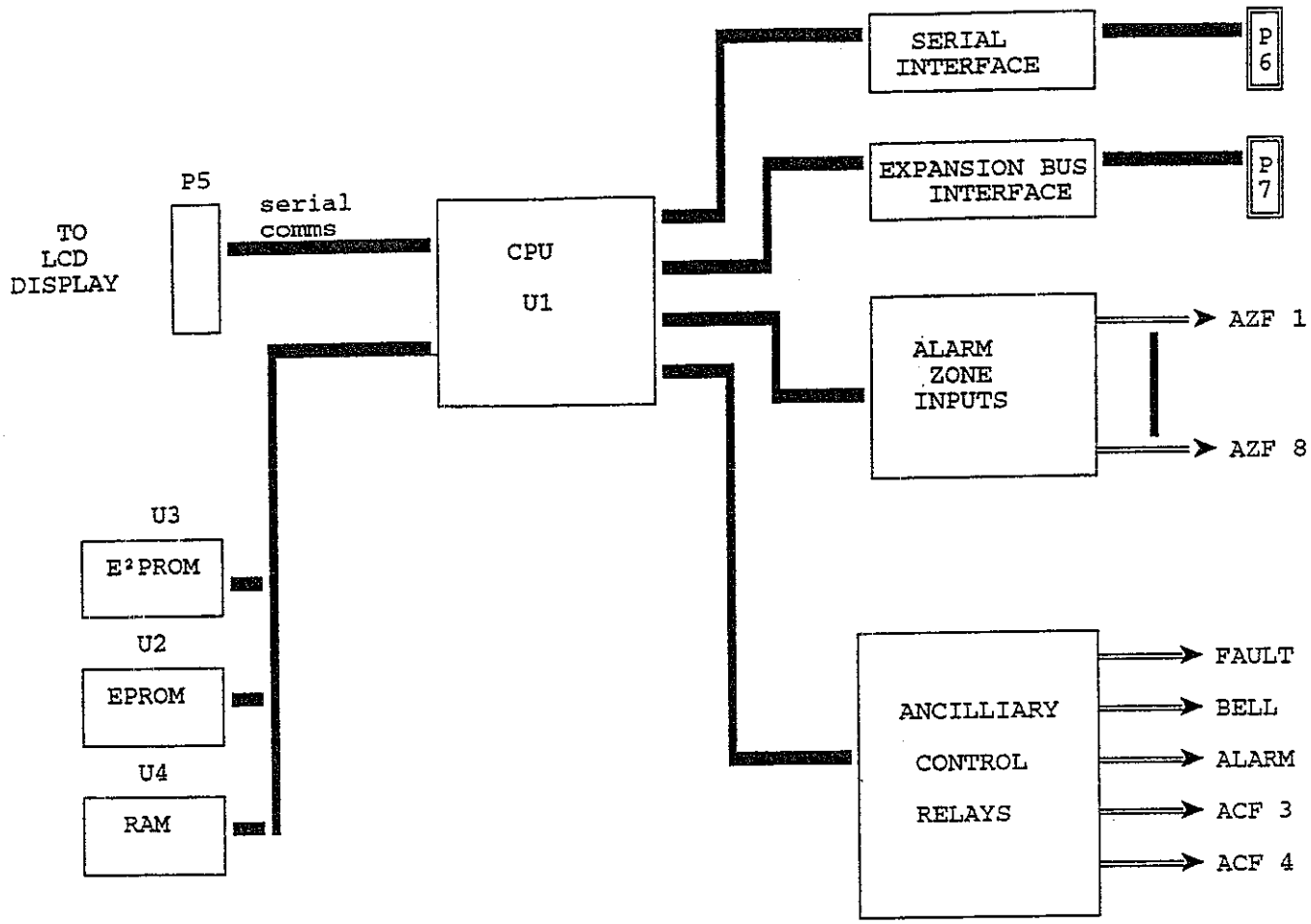
3.1 OVERVIEW

The master controller board is the heart of the 4020 system and contains all the elements for an 8 zone fire indicating panel:

- 8 alarm zone circuits
- 4 output circuits (bell, alarm and two uncommitted output circuits for fire brigade connections)
- Power supply/battery charger
- Serial port configurable for 2120 communications, remote mimic interface or printer output
- Expansion port for connection of additional alarm zone modules or ancillary control modules
- Serial interface for operator Keyboard/Display module.
- Terminations for field wiring.

3.2 SPECIFICATION

Operating voltage:	18 to 32 VDC
Operating current:	120mA Quiescent 260mA Alarm (2 zones in alarm)
Fuse protection:	F1 - Transformer Secondary - 3 Amp or 6 Amp(3 Amp PSU) F2 - Battery Charger - 2 Amp F3 - Internal 24V supply - 2 Amp F4 - Bell - 2 Amp F5 - External 24V field supply - 2 Amp
Microprocessor Type:	Signetics S80C552 8-bit microcontroller
Memory Type:	EPROM - 32K x 8 or 64K x 8 E²PROM - 8k x 8 RAM - 32K x 8
Alarm zone input circuits:	8 off, fitted with 3.3K ohm, 1/2W End of Line resistors.
Signal output circuits:	4 off, single pole N.C. or N.O. contact 2 Amp @ 30 Volt.
Battery charger current:	0.6 Amp - 7AHr battery. 1.2 Amp - 12AHr battery.
Battery charger monitoring:	Charger High, Charger Low, Battery Fault.
Power Supply:	24V DC @ 1.5A or 4A nominal
Field power:	24V DC fused @ 2 Amp nominal.
Earth fault monitoring:	Jumper selectable
Transient protection:	Metal Oxide Varistors (MOV) connected to system earth.
Status indicators:	24 Volt power, Battery boost charge
Dimensions:	205mm x 140mm
Terminations:	Screw Terminal blocks maximum wire size 2.5mm²



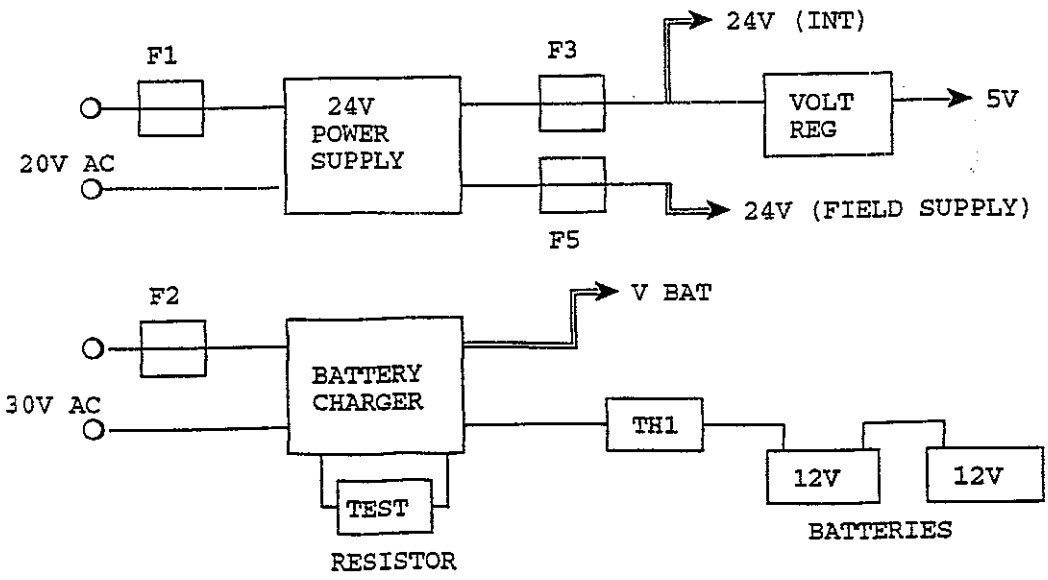


FIGURE 3.1 BLOCK DIAGRAM MASTER CONTROLLER BOARD

3.3 FUNCTIONAL DESCRIPTION

The master controller board is the heart of the 4020 system and contains all the elements for an 8 zone fire indicating panel. System expansion is provided by connecting additional Alarm Zone or Ancillary Control cards to the expansion control bus. The Master Controller provides system control, synchronisation and supervision of all connected circuits.
Figure 3.1 contains the block diagram of the Master Controller which is divided into the following functional blocks:

3.3.1 MICROCOMPUTER CIRCUITS

The microcomputer circuit controls all the operational functions of the Master Controller Board. The circuit is built around a Signetics S80C552 CMOS single Chip 8-Bit Microcontroller (MCU) (U1) which has the following in-built features: 8 channel A/D converter, 1 serial port, 256 bytes of RAM, 4 counter/timers(including watchdog timer and 6 8-bit I/O ports).
The MCU internal clock is generated from the 16 MHz crystal source Y1. The voltage reference for the in-built A/D converter is provided by the precision voltage reference VRF1. Potentiometer RV1 provides adjustment of the voltage reference and is used to set to set the thresholds for battery charger monitoring.

The system operating firmware is contained in an external EPROM (U2). Link JP2 allows either a 32K x 8 or 64K x 8 EPROM to be used. The 8K x 8 E^2PROM (U3) provides non-volatile storage of field configurable job specific parameters eg zone types, zone labels, output control list parameters etc. A 32K x 8 external RAM (U4) provides additional memory to supplement the 256 bytes of in-built RAM contained on the Microcontroller. IC U5A provides address decoding for the E^2PROM (U3) and the Dual UART U7 while U5B provides address decoding for the RAM (U4) via the supervisory IC U14 thereby providing write protection for the RAM.

The supervisory IC U14 provides the following key functions:
- Generates the microprocessor reset pulse (50msec delay before reset).
- Generates the watchdog timeout signal.
- Generates power failure warning.

The Pushbutton PB1 provides a means of externally resetting the Microcontroller by holding the reset pin15 HIGH while PB1 is depressed.

3.3.2 ALARM ZONE INPUTS

Eight (8) separate zone input circuits are provided, each monitoring 2-wire normally open contact actuating devices. The microcontroller in conjunction with its internal A/D converter, scans each zone input in sequence via the analog multiplexer U10, to determine zone status ie alarm, normal or fault states of the connected actuating devices.
The zone input voltage is fed into A/D convertor channel 0 (pin1/U1) of the MCU and converted by the in-built A/D convertor into a digital value. This digital value is then compared against reference values to determine the zone status. The reference voltage for the A/D convertor is derived from the voltage divider network of RN3 (pin 1) and RN4 (pin 2) and fed into channel 6 (pin63) of U1. This ensures that variations in 24V supply will be tracked by the reference voltage. Figure 3.2 summarizes the AZF alarm, fault and

quiescient parameters over the supply voltage range.

AZF PARAMETERS	SUPPLY VOLTAGE VDC		
	21.6	24	28.2
Maximum Alarm Current (short circuit across zone)	56.7mA	63mA	74mA
Alarm Test Current	12mA	13.3mA	15.7mA
Alarm Threshold - Max (+5%)	10.5mA	11.7mA	13.7mA
- Typ	10mA	11.1mA	13mA
- Min (-5%)	9.5mA	10.6mA	12.4mA
Quiescent Current (including E.O.L. resistor - Max (+5%)	6mA	6.7mA	7.8mA
- Typ	5.7mA	6.3mA	7.4mA
- Min (-5%)	5.4mA	6mA	7mA
Fault threshold - Max (+5%)	4.2mA	4.7mA	5.5mA
- Typ	4mA	4.4mA	5.2mA
- Min (-5%)	3.8mA	3.6mA	4.2mA
Fault Test Current	3.2mA	3.6mA	4.2mA

Figure 3.2 AZF Parameters

3.3.2.1 Alarm Zone Description

As each zone circuit is identical the following description will refer to one zone only (refer fig. 3.3). The positive input(+) on each zone provides 24V DC to power connected detector circuits via the transistor switch U8. The negative input(-) on each zone provides the return current path for zone monitoring circuitry. Each monitor zone is supervised and requires a 3.3K ohm end of line terminating resistor located across the last detector or device on the zone. The voltage divider configuration of the 3k3 ohm end of line resistor and 390 ohm sense resistor ensure that changes in the 24V supply voltage do not affect the zone thresholds.

Zone short circuit current is limited to 74mA (max) via an onboard 390 ohm sense resistor.

The metal oxide varistors V1 and V2 connected to system earth, together with the resistor networks RN7 and RN5 provide transient and overvoltage protection on each zone input.

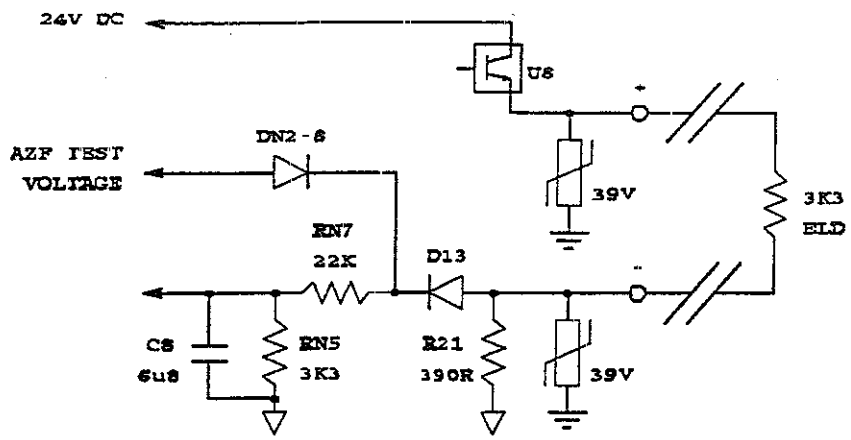


Figure 3.3 Alarm Zone Circuit

Alarm and Fault simulation is achieved by disabling the Zone supply voltage and applying a Test Voltage via diode network DN2 across the Zone input.
The test voltage equals the voltage developed across the sense resistor R21 under alarm and fault conditions and is set to a value 20% outside the typical Upper Alarm and Lower Fault thresholds at the minimum supply voltage of 21.6V
Refering to figure 3.2 these values are determined as follows:

Alarm Test Voltage = R21 x (typ alarm current @ 21.6V + 20 %)
= 390 ohm x (10mA +20%)
= 390 x 12mA
= 4.68V

Fault Test Voltage = R21 x (typ fault current @ 21.6V - 20 %)
= 390 ohm x (4mA - 20%)
= 390 x 3.2mA
= 1.25V

The Test Voltage is generated by the divider network formed by R12 and R13 and R14 and buffered by amplifier U13B. Resistor R12 is effectively switched out of the divider network when generating the Fault test voltage.

Detector reset is provided by removing power to each zone via the transistor switch U8.
The processing of alarm zone time delays is handled by the MCU firmware program which provides the following delays:

TIME DELAY	MEAN VALUE
AZF Alarm	5 Sec
AZF Reset	10 Sec
AVF Reset	10 Sec
AVF Confirmation Period	170 Sec

3.3.3 SIGNAL OUTPUTS

Five (5) signal output circuits are provided namely: BELL, FAULT, ALARM, ACF3, ACF4.

The **BELL** output circuit provides a switched 24 volt output via relay K2 and is protected via fuse F4 rated @ 1 Amp. Supervision is provided on the BELL circuit and requires a 10K end of line resistor. Under normal quiescent state, the supervision voltage across the bell is of a reverse polarity and in the range 6V-8V DC. The bell voltage is monitored via A/D convertor channel 4 (pin65/U1) of the MCU . Under alarm conditions, the operation of the bell circuit is controlled by the panel door switch and is de-activated when the panel door is opened.
Metal oxide varistors V19 and V20 provide transient protection on the bell output lines.

The **FAULT** output circuit consists of a failsafe energised relay K1 providing a set of voltage free contacts. The relay is held in the energised position via control output pin4/U1 of the MCU and de-energises whenever the watchdog timer times out or the panel operating voltage is below the minimum voltage to ensure correct panel operation. ie indication that the panel has failed. A link allows the selection of normally open (N.O.) or normally closed (N.C.) contacts.

The **ALARM (ACF2)** relay K3, **ACF3** relay K4 and **ACF4** relay K5 output circuits provide voltage free contacts which are jumper selectable as normally open (N.O.) or normally closed (N.C.) contacts. The relays operate under program control from the MCU via the latch driver U9.

3.3.4 EXPANSION BUS INTERFACE

The digital to analogue convertor (D/A) U12 generates test and reference signals which are fed to the expansion cards via the buffer amp U13B. Port 4 /U1 of the MCU provides the data bus for the expansion cards and together with output of U13B are fed to connector P7 to provide data, test and reference signals to interface to expansion modules. A maximum of five expansion modules can be added to the system. The expansion modules can be either 8 zone Fire alarm monitor modules (ASSY 002-010) or 4 Point Control modules (ASSY 002-009). A 16 way ribbon connector connects each of the expansion modules to the main control board in a daisy chain configuration. A separate connector P4 is provided to supply 24V DC to each expansion card.

3.3.5 LCD DISPLAY BOARD INTERFACE

The LCD Display interface provides a serial data link together with reset and 24V dc power signals for the LCD Display board. The serial data link is via the transmit and receive channels (pin 24/pin25 U1) of the MCU on-board UART. Connection is made via ribbon connector P5 and is supervised for loss of communication with the master controller.

3.3.6 SERIAL PORT

U7 provides a dual channel full duplex serial port for interfacing to either of the following devices:

(1) Remote Mimic / 2120

(2) Remote Mimic / Serial Printer

Crystal Y2 provides the oscillator source for the on-board baud rate generator in U7.
Connector P6 provides the physical connection for the external serial port interface.
A special interface card plugs into connector P6 to configure the serial port for the required device. Each interface card provides optical isolation and transient protection. Terminations to external devices is via terminal blocks.
Baud rate setting is done automatically when configuring the device type in the panel programming mode and is set as follows:

DEVICE	BAUD RATE SETTING
Remote Mimic	1200
2120	4800
Printer	4800

3.3.7 POWER SUPPLY / BATTERY CHARGER

The Power Supply / Battery Charger consists of two separate circuits, one for the 24V DC supply, the other for charging the batteries. Both circuits are fed from the Mains Transformer T1 which provides the following two windings:

(1) A 20V ac winding rated at either 1.5 or 4 Amps for the 24V dc power supply circuit .

(2) A 30V ac winding rated at 2.5 Amps for the Battery Charger circuit.

3.3.7.1 24V POWER SUPPLY

The 24V DC power supply comprises a bridge rectifier BR1, filter capacitor C1 and mains fail detect circuit BR3 and relay K6. Fuse **F1** provides protection against short circuit fault of the bridge rectifier and filter capacitor. Fuse **F3** provides protection against short circuit fault of the internal 24V electronics circuitry. Fuse **F5** provides short circuit protection for 24V connected to external field devices. Voltage regulator VR1 provides a regulated 5V DC supply rated at 1.5Amp for powering the microcontroller and associated digital circuits.

Changeover to Standby battery operation is controlled via Bridge rectifier BR3 and relay K6. This relay is normally energised under Mains On condition selecting the AC Power Supply Source. Under Mains Fail conditions, relay K6 de-energises to select standby battery power source

3.3.7.2 BATTERY CHARGER

The battery charger has been designed to charge sealed lead-acid cells and provides battery test and monitoring facilities in accordance with AS1603.4. A thermal cut-out TH1 provides short-circuit protection for the battery. Fuse **F2** provides protection against short-circuit fault of the battery charger circuit.
The battery voltage is continually monitored by the microcontroller and a fault condition is annunciated if the battery is disconnected or the voltage is outside the limits as shown in table 3.1.

BATTERY STATUS	BATTERY VOLTAGE
Charger High	Above 28 Volts
Normal	27 - 28 Volts
Charger Low	Below 27 Volts
Battery Fault	Below 24 Volts

Table 3.1 Battery Status Thresholds.

The battery charger can operate in either of two modes ie Boost Charge or Trickle Charge mode.

During Boost Charge mode, battery charging current is supplied directly from the filtered supply comprising of bridge rectifier BR2 and filter capacitor C2. The battery charging current is limited by switching the battery load test resistor, via relay K8, in series with the battery. This limits the maximum charging current to either 0.6 Amps for 7Ahr batteries or 1.2 Amps for 12Ahr batteries.

In the Trickle Charge mode, Voltage regulator VR2 provides a constant charger voltage with maximum charging current limited to 0.2 Amps. In this mode, the charger output voltage is adjustable via RV2 over the range 25V - 29 Volts.

Selection of charger operating mode is done automatically by the MCU U1. The MCU continually monitors the battery voltage via A/D Channel 5 (pin64/U1) and changes the charger mode when the battery voltage reaches the thresholds as shown in table 3.2

CHARGER MODE	BATTERY VOLTAGE
Trickle Charge	24V < Vbat > 26V
Boost Charge	28V < Vbat > 24V

Table 3.2 Battery Charger Modes

The Battery load test facility is controlled by the MCU/U1. Whenever the Battery Test key is selected, the MCU switches a test load resistor across the batteries via relay K7 to discharge the batteries at the following rate:

I(dis) = C/10 C = Battery Capacity - 7Ahr or 10Ahr

for a period of 1 minute. At the end of the discharge period the battery voltage is checked. If the voltage is less than 24Volts, a battery fault condition is indicated.
The battery test resistor provides two tappings to cater for either 7Ahr or 12Ahr batteries.

3.4 SERVICING

Servicing of the card is limited to the adjustments set-out below. The card does not contain any field repairable components except fuses. Repair of a faulty card is by card replacement only.

3.4.1 BOARD CONNECTIONS

P1 4 pin connector to transformer secondary windings.

P2 2 pin connector to batteries.

P3 2 pin connector to battery test resistor.

P4 4 pin connector providing 24V supply to expansion cards

P5 14 way ribbon connector to P1 on LCD Display board. It provides serial data link and 24V power connection.

P6 16 way ribbon connector to P1 on MIMIC/RS232 board. It provides serial data link and 5V and 24V power connection.

P7 16 way ribbon connector to expansion cards. It is located on the rear side of the board and carries data, test and reference signals between the master controller and connected expansion cards.

3.4.2 BOARD JUMPER SETTINGS

JP1 Jumper JP1 can be removed to disable Ground Short detection. This should only be removed in installations where wiring standards require that one side of the power supply be earthed. **Default setting is JP1 installed.**

JP2 Jumper JP2 selects the installed System Eprom Size either 256K or 512K. **Default setting is for 256K.**

ALARM Jumper allows the selection of Normally Open (N.O.) or Normally Closed (N.C.) alarm relay contacts. **Default setting is N.O.**

FAULT Jumper allows the selection of Normally Open (N.O.) or Normally Closed (N.C.) Panel Fail/Low Voltage alarm relay contacts. **Default setting is N.O.**

ACF3 Jumper allows the selection of Normally Open (N.O.) or Normally Closed (N.C.) contacts for Ancillary Control ACF3. **Default setting is N.O.**

ACF4 Jumper allows the selection of Normally Open (N.O.) or Normally Closed (N.C.) contacts for Ancillary Control relay ACF4. **Default setting is N.O.**

3.4.3 BOARD REMOVAL

STEP 1 Disconnect batteries (if fitted) and disconnect AC power to the panel by switching the MAIN switch OFF.

STEP 2 Disconnect and mark any field wiring connected to Termination blocks TB1 and TB2.

STEP 3 Disconnect the following internal wiring harnesses:

P1 - 4 pin connector to mains transformer.
P2 - 2 pin connector to battery.
P3 - 3 pin connector to battery test resistor.
P4 - 2 pin connector for 24V expansion board power bus.
P5 - 14 way ribbon connector to LCD display board.

STEP 4 Remove the six (6) pcb mounting screws.

STEP 5 Unplug the expansion bus ribbon connector P7 located on the rear side of the board.

3.4.4 BOARD INSTALLATION

STEP 1 Plug-in the expansion bus ribbon connector P7 located on the rear side of the board.

STEP 2 Locate the board over the six pcb mounting posts and mount using the six pcb mounting screws.

STEP 3 Connect the following internal wiring harnesses:

P1 - 4 pin connector to mains transformer.
P2 - 2 pin connector to battery.
P3 - 3 pin connector to battery test resistor.
P4 - 2 pin connector for 24V expansion board power bus.
P5 - 14 way ribbon connector to LCD display board.

STEP 4 Re-connect any field wiring to terminal blocks TB1 and TB2.

STEP 5 Turn AC power to the panel ON by switching the MAIN switch ON and connect the batteries if fitted.

3.4.5 BATTERY CHARGER ADJUSTMENT

To set the battery charger output voltage to the correct level and set the thresholds for battery charger high and low fault conditions,use the following procedure:(Figure 3.4 shows the location of adjustment points).

STEP 1 Ensure the batteries are disconnected.

STEP 2 Adjust potentiometer RV2 to set the voltage across the battery charger terminals to 27.6V DC

STEP 3 Locate potentiometer RV1 on the main PCB and press the CPU RESET switch located on the main PCB to clear the current BATtery fault condition due to battery removal.

STEP 4 Turn RV1 anti-clockwise until a BATtery HI condition is indicated on the display.If the battery fault condition is brought up before completing this step,press the CPU RESET switch and continue the adjustment.

STEP 5 Press the CPU RESET switch .Then adjusting RV1 clockwise ,count the number of turns until a BATtery LO condition is indicated on the display.

NOTE: If the battery fault condition is brought up before completing this step,press the CPU RESET switch and continue the adjustment.

STEP 6 Then turn RV1 anti-clockwise by half the number of turns obtained in step 5.The display should now indicate BATttery OK condition.

NOTE: If the battery fault condition is brought up before completing this step,press the CPU RESET switch and continue the adjustment.

STEP 7 Re-connect the batteries and press the CPU RESET switch to reset the system.

CAUTION - POWERING REQUIREMENT

When removing power from the panel, disconnect batteries **FIRST** and **AC** power last. When connecting power to the system,connect **AC** power **FIRST** and batteries last.

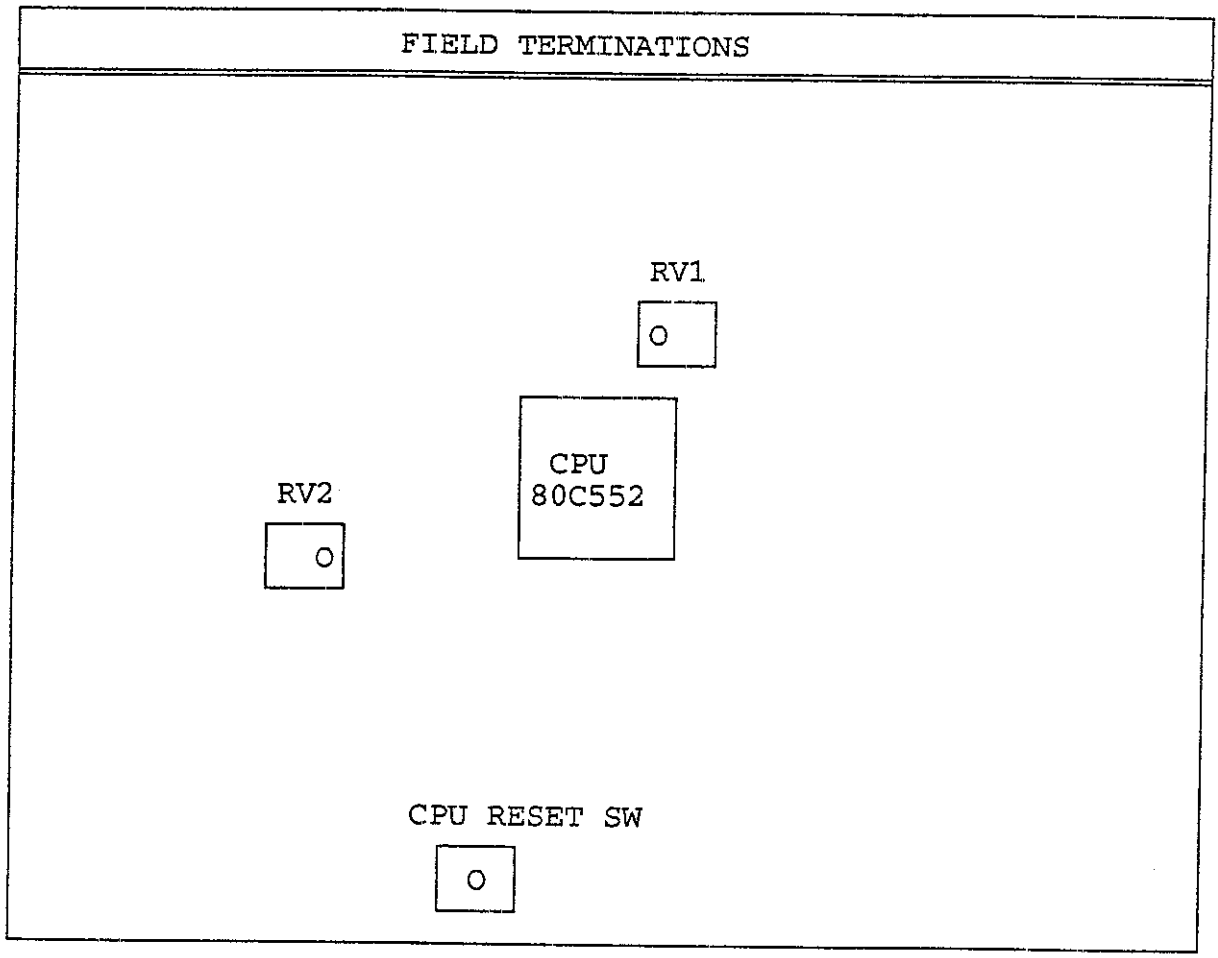


FIGURE 3.4 MAIN PCB - BATTERY CHARGER ADJUSTMENT POINTS

3.4.6 LED INDICATORS

LD1 Indicates the presence of 24 Volt power.

LD2 Indicates the Battery Charger is operating in boost charge mode.

3.4.7 FUSES

F1	Transformer Secondary Fuse	rated @ 3 amp or 6 amp (3 amp PSU)
F2	Battery Charger Fuse	rated @ 2 amp
F3	Internal 24V supply fuse	rated @ 2 amp
F4	Bell fuse	rated @ 2 amp
F5	External 24V field supply	rated @ 2 amp

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4 LCD DISPLAY

4.1 OVERVIEW

The LCD display board functions as terminal for displaying panel status information which is transmitted from the master controller as formatted message display strings. Front panel keypress information is transmitted serially from the LCD display board to the master control board for actioning.
The LCD display board is connected to the master controller via a 14 way ribbon connector which provides the physical link for 24V power bus and serial communications bus. The connection is supervised and a fault condition is annunciated on the LCD display in the event of a loss of communications to the Master Controller board.

4.2 SPECIFICATION

Operating Voltage:	18 to 32V DC
Quiescent Current:	240mA Mains Power 80mA Battery Power
Dimensions:	215mm x 140mm
Keyboard:	5 row by 5 column mylar membrane
LCD Display:	40 Character by 2 line High contrast Supertwist display LED Backlighting Adjustable viewing and contrast control
Status Indicators:	6 off - Common Alarm - Common Fault - Common Isolate - Mains Isolate. - Bell Isolated. - ACF Isolated.

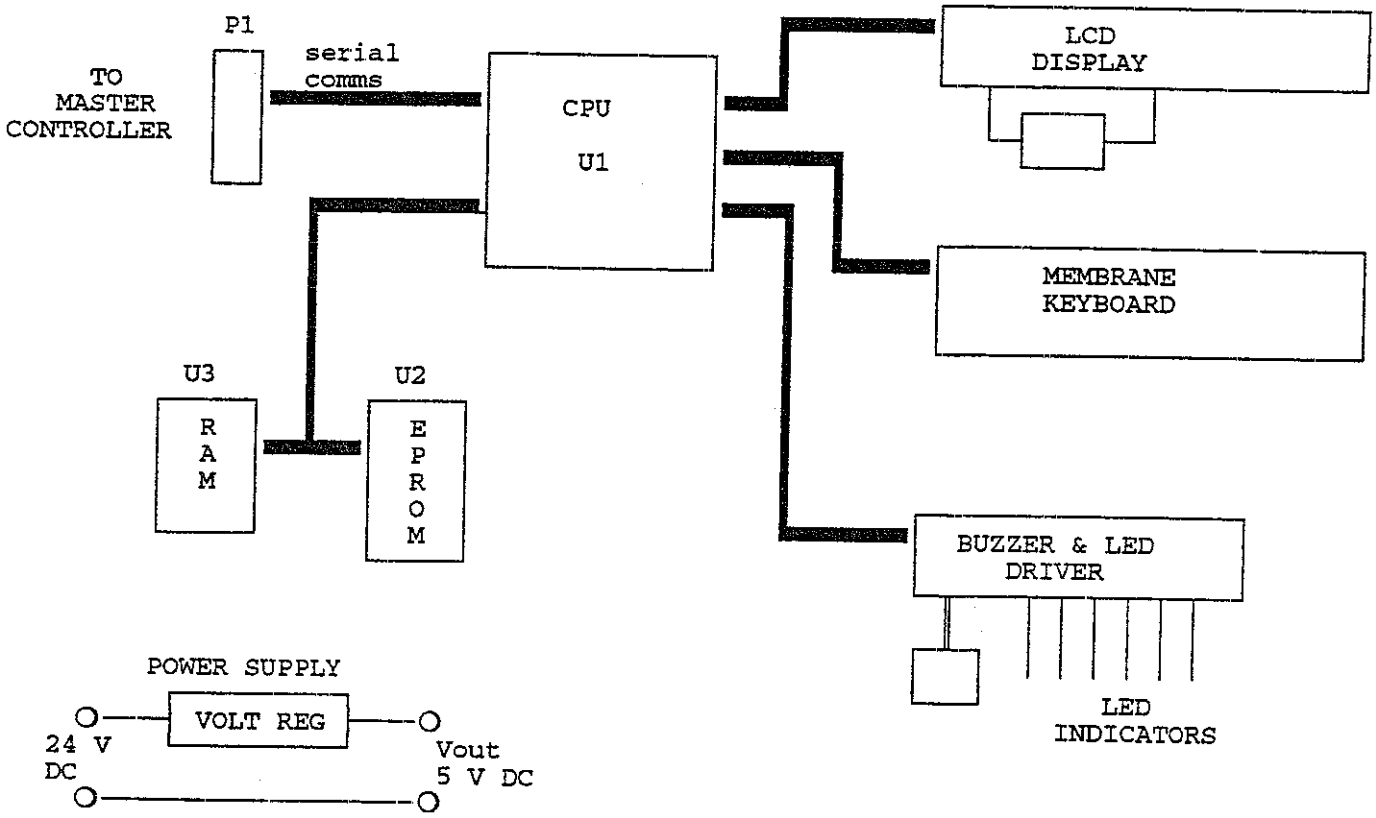


FIGURE 4.1 BLOCK DIAGRAM LCD DISPLAY BOARD

4.3 FUNCTIONAL DESCRIPTION

Figure 4.1 contains the block diagram of the Display Board which is divided into the following functional blocks:

4.3.1 MICROCOMPUTER CIRCUITS

The microcomputer circuit (MCU) controls all the operational functions of the Display Board. The circuit is built around a Signetics S80C552 Single Chip 8-Bit Microcontroller which has the following in-built features: 8 channel A/D converter, 1 serial port, 256 bytes of RAM, 4 counter/timers(including watchdog timer and 6 8-bit I/O ports. Crystal Y1 provides 16Mhz source for the MCU internal clock.

The Display Board operating firmware is contained in an external EPROM (U2). Link JP8/JP9 allows either a 32K x 8 or 64K x 8 EPROM to be used. A 32K x 8 external RAM (U3) provides additional memory to supplement the 256 bytes of in-built RAM contained on the Microcontroller.

The on-board serial port is utilised to provide the serial communication port to the Master Controller.

4.3.2 LCD DISPLAY

The LCD display is a 40 character by 2 line display featuring a high contrast supertwist LCD with LED backlighting. The interface to the LCD is via Port P4 of the MCU which provides the bi-directional 8 bit data transfer bus. While port P1.3- P1-5 of the MCU control bus to the LCD display. Under Mains Fail conditions the MCU disables the LED backlighting to conserve standby battery power and will turn ON only when there is a status change at the panel (ie alarm, fault etc). Once the status change has been acknowledged and there is no keyboard activity for a period of 5 minutes, the LED backlighting will again turn OFF.
Trimpot TR1 located on rear of the Display Board, allows the viewing angle and contrast of the LCD Display to be adjusted to optimum level.

4.3.3 MEMBRANE KEYBOARD

The keyboard is a flat membrane type. The switch matrix is connected to input port P5 of the MCU. The MCU inconjunction with the row select control IC U8 scans the matrix for a valid keypress. When a valid keypress is decoded, the MCU generates an audible "key-click" via the piezo buzzer B2.

4.3.4 ALARM/FAULT SOUNDER AND LED DRIVER

The Alarm/Fault sounder and LED driver circuit is implemented using a serial clocked high current data latch U5. On/OFF control signals in the form of serial data is transmitted to the latch from the CPU to control the sounder B1. The latch is also used to control the LED backlighting for the LCD display via resistor R4.

4.3.5 POWER SUPPLY

The 24V DC power from the Master Controller is regulated down to 5V via the Voltage regulator VR1. The 5V supply is used to power the CPU, LCD display and memory circuits. The 24V supply is also used to drive the LCD backlighting, buzzer and LED indicators.

4.4 SERVICING

Servicing of the card is limited to the adjustments set-out below. The card does not contain any field repairable components except fuses. Repair of a faulty card is by card replacement only.

4.4.1 BOARD CONNECTIONS

P1 14 way ribbon connector to P5 on LCD Display board. It provides serial data link and 24V power connection.

KEYBD 10 way mylar ribbon connector to membrane keyboard.

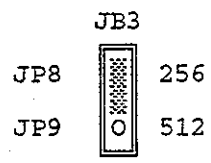
4.4.2 BOARD JUMPER SETTINGS

The location of the board jumper settings are shown in figure 4.2 and there settings are described below:

JB1 Jumper JB1 selects whether the CPU reset signal is generated locally or from the Master Controller Board. **Default setting is JP2 position ,reset signal generated from Master Controller Board.**

JB2 Jumper JB2 selects the signal routing for the Transmit and Receive signals to the Display Board CPU. **Default setting is JP7 position.**

JB3 Jumper JB3 selects the installed Display Eprom Size either 256K (JP8) or 512K (JP9). **Default setting is for 256K (JP8) position.**



4.4.3 LCD VIEWING ANGLE AND CONTRAST ADJUSTMENT

Trimpot TR1 located on rear of the Display Board, allows the viewing angle and contrast of the LCD Display to be adjusted to optimum level.

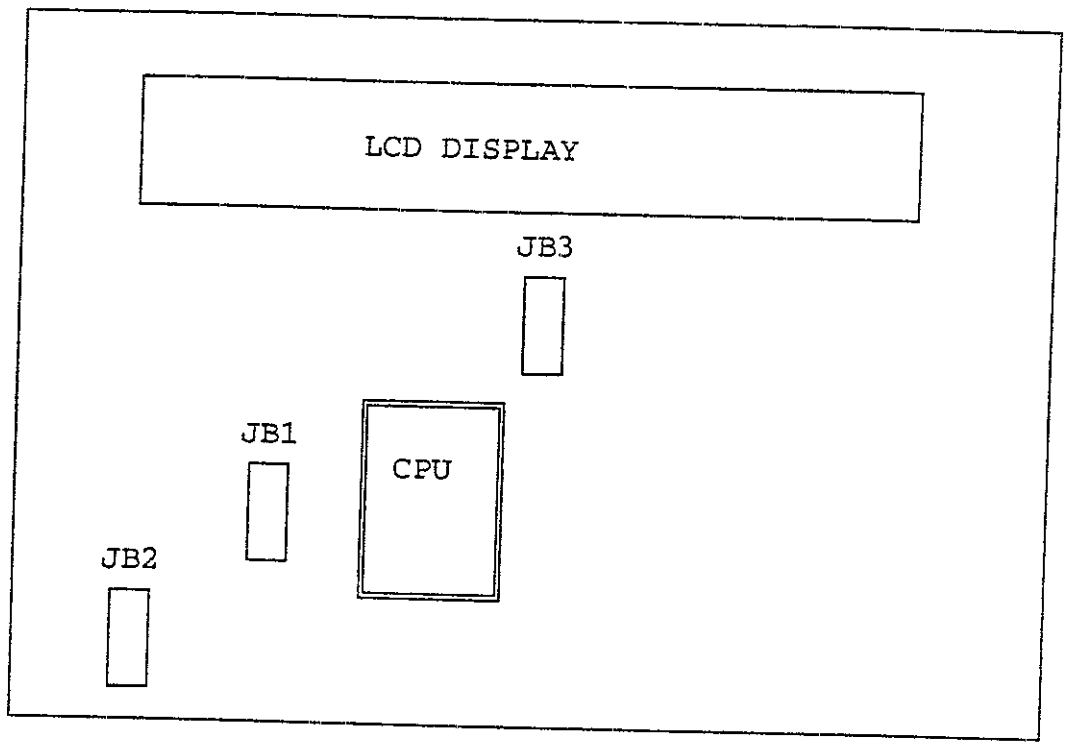


FIGURE 4.2 LOCATION OF JUMPERS

4.4.4 BOARD REMOVAL

STEP 1 Disconnect batteries (if fitted) and disconnect AC power to the panel by switching the MAIN switch OFF.

STEP 2 Disconnect the following internal wiring harnesses:

P1 - 14 way ribbon connector to Master Controller board.
KEYBD - 10 way flat cable keyboard membrane connector.

STEP 3 Unscrew the keyboard earthing strap.

STEP 4 Remove the four (4) pcb mounting screws.

4.4.5 BOARD INSTALLATION

STEP 1 Locate the board over the four pcb mounting posts and mount using the four pcb mounting screws.

STEP 2 Re-connect the following internal wiring harnesses:

P1 - 14 way ribbon connector to Master Controller board.
KEYBD - 10 way flat cable keyboard membrane connector.

STEP 4 Re-connect the keyboard earthing strap.

STEP 5 Turn AC power to the panel ON by switching the MAIN switch ON and connect the batteries if fitted.

4.4.6 LED INDICATORS

LD1 Common Alarm LED.

LD2 Common Fault LED.

LD3 Common Isolate LED.

LD4 Isolated ACF LED.

LD5 Mains Power ON LED.

LD6 Bell Isolated LED.

5 8 POINT MONITOR CARD

5.1 OVERVIEW

The 8 Point Monitor Card Assy. No. 002-009, is designed to interface with Alarm Actuating Devices such as Smoke and Heat detectors, Manual Call Points, Pressure Switches etc.
The card provides alarm zone expansion above the basic 8 zones contained on the Master Controller Module. Zone expansion is in groups of 8 zones with a maximum limit of five 8 point Monitor cards or 40 additional zones.
Connects to the Master Controller via an expansion bus interface providing data, test and reference signals.

5.2 SPECIFICATION

Voltage range:	18 to 32 VDC
Current draw:	Quiescent @ 28 VDC - 100mA Alarm - 100mA + 70mA max per shorted zone.
Temperature:	-5 deg. to +55 deg. C dry heat. +40 deg. C at 95% relative humidity.
Dimensions:	98mm x 140mm
Terminations:	Screw Terminal blocks maximum wire size 2.5mm^2

5.3 FUNCTIONAL DESCRIPTION

The Monitor Card provides eight (8) separate zone input circuits , each monitoring 2-wire normally open contact actuating devices. Each card occupies a particular address location from 0 to 4. Each card address is set via a 4 way DIP switch located on the card.The Master Controller addresses each card via the expansion bus enabling it to scan each input in sequence to determine zone status ie alarm, normal or fault states of the connected actuating devices.

5.3.1 Expansion Bus Interface

The expansion bus interface comprises of input/output expander IC1 and address comparator IC2. All communication with the Master Controller, occurs on port 2 (P20-P23) of IC1 with the timing through the clock input of pin7/IC1 (PROG). Port 4/IC1 (P40-P43) is programmed as an input port and via the jumper settings of JB1 determines the card type ie: 8 point monitor card or 4 point control card. Port 5/IC1 (P50-P53) is also programmed as an input port and is used for reading the zone status via the 4-bit

multiplexer IC8. Port 6 (P60-P63) is programmed as an output and is used to control the 24V Alarm zone supply voltage via the 8-bit addressable latch IC7 and octal darlington driver IC6.

The 4 way DIP switch SW1 is used to set the card address. The address is decoded by address comparator IC2 to provide the active low chip select signal for IC1.

The 24V power bus to each card is fused via fuse F1. The on-board voltage regulator VR1 is used to provide a 5 Volt supply to power the expansion bus interface circuits.

5.3.2 Alarm Zone Inputs

Eight (8) separate zone input circuits are provided, each monitoring 2-wire normally open contact actuating devices. The master controller scans each alarm zone input via the expansion bus interface. The alarm zone voltage is fed into comparators IC3 and IC4 and compared against the alarm / fault threshold voltage V REF generated from the Digital-to-Analogue convertor(U12) on the Master Controller board. The output of the comparators are fed back onto the expansion bus via the multiplexer IC8.

Figure 5.1 summarizes the AZF alarm, fault and quiescient parameters over the supply voltage range.

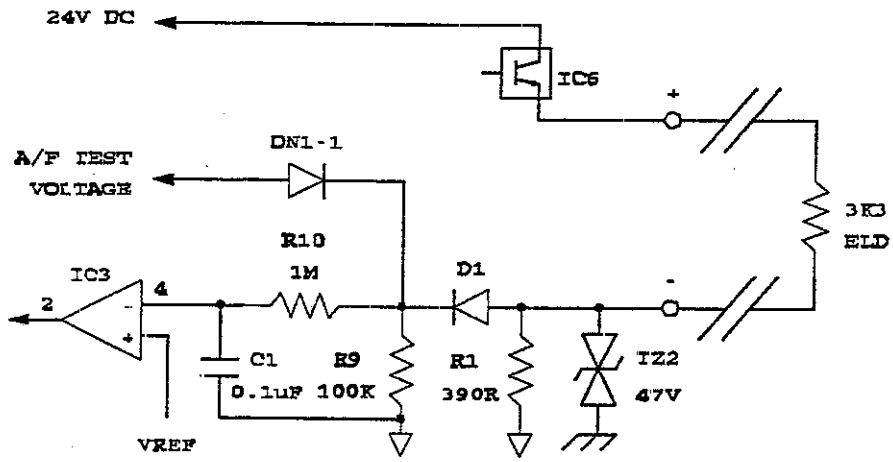
Figure 5.1 AZF Parameter Table

AZF PARAMETERS	SUPPLY VOLTAGE VDC		
	21.6	24	28.2
Maximum Alarm Current (short circuit across zone)	56.7mA	63mA	74mA
Alarm Test Current	12mA	13.3mA	15.7mA
Alarm Threshold - Max (+5%)	10.5mA	11.7mA	13.7mA
- Typ	10mA	11.1mA	13mA
- Min (-5%)	9.5mA	10.6mA	12.4mA
Quiescent Current (including E.O.L. resistor - Max (+5%)	6mA	6.7mA	7.8mA
- Typ	5.7mA	6.3mA	7.4mA
- Min (-5%)	5.4mA	6mA	7mA
Fault threshold - Max (+5%)	4.2mA	4.7mA	5.5mA
- Typ	4mA	4.4mA	5.2mA
- Min (-5%)	3.8mA	3.6mA	4.2mA
Fault Test Current	3.2mA	3.6mA	4.2mA

5.3.2.1 Alarm Zone Description

As each zone circuit is identical the following description will refer to one zone only (refer fig. 5.2). The positive input(+) on each zone provides 24V DC to power connected detector circuits via the transistor switch IC6. The negative input(-) on each zone provides the return current path for zone monitoring circuitry.

Figure 3.3 Alarm Zone Circuit



Each monitor zone is supervised and requires a 3.3K ohm end of line terminating resistor located across the last detector or device on the zone. The voltage divider configuration of the 3k3 ohm end of line resistor and 390 ohm sense resistor ensure that changes in the 24V supply voltage do not affect the zone thresholds.

Zone short circuit current is limited to 74mA (max) via an onboard 390 ohm sense resistor.

The transzorb TZ2 is connected to system earth and with the resistor divider R9 and R10 provide transient and overvoltage protection on each zone input.

Alarm and Fault simulation is achieved by disabling the Zone supply voltage and applying a Test Voltage via diode network DN1 across the Zone input. The test voltage equals the voltage developed across the sense resistor R1 under alarm and fault conditions and is set to a value 20% outside the typical Upper Alarm and Lower Fault thresholds at the minimum supply voltage of 21.6V

Referring to figure 5.1 these values are determined as follows:

Alarm Test Voltage = R21 x (typ alarm current @ 21.6V + 20 %)
= 390 ohm x (10mA +20%)
= 390 x 12mA
= 4.68V

Fault Test Voltage = R21 x (typ fault current @ 21.6V - 20 %)
= 390 ohm x (4mA - 20%)
= 390 x 3.2mA
= 1.25V

The Test Voltage (A/F TEST VOLTAGE) is generated by the Master Controller board and applied through the transistor switch Q3.
Detector reset is provided by removing power to each zone via the transistor switch U8.

The processing of alarm zone time delays is handled by the MCU firmware program which provides the delays as shown in table 5.1 below.

TIME DELAY	MEAN VALUE
AZF Alarm	5 Sec
AZF Reset	10 Sec
AVF Reset	10 Sec
AVF Confirmation Period	170 Sec

Table 5.1 AZF processing time delays.

5.4 SERVICING

Servicing of the card is limited to the adjustments set-out below. The card does not contain any field repairable components except fuses. Repair of a faulty card is by card replacement only.

5.4.1 BOARD CONNECTIONS

P2 - is used to connect the card to the CPU bus.

P1 - 24 volt power bus connector. It connects the card to the 28 VDC system supply.

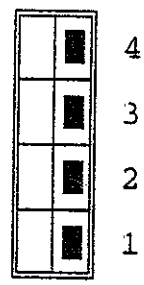
TB1 - terminates the 8 field zones.

End Of Line Resistor: 3K3 OHM , 1/2W

5.4.2 SWITCH SETTINGS

Dip switch SW1 selects the card address 0 to 4. The following table shows the card address and the required switch setting. The first expansion card is always set to address 0 and each additional card is set at the next sequential address.

CARD NO	ADDRESS	SWITCH SETTING | 4 | 3 | 2 | 1 |
1	0	|OFF|OFF|OFF|OFF|
2	1	|OFF|OFF|OFF|ON |
3	2	|OFF|OFF|ON |OFF|
4	3	|OFF|OFF|ON | ON|
5	4	|OFF| ON|OFF|OFF|



ON <- OFF
DIP SWITCH

5.4.3 LED INDICATOR

LD1 'CARD ACTIVE' led provided for two purposes. Firstly the led flashes every few seconds to indicate the card has power and is being polled by the CPU. Its second purpose is to indicate the absence of an End Of Line Resistor on one of the zones. When this occurs the led flashes rapidly.

5.4.4 BOARD REMOVAL

STEP 1 Disconnect batteries (if fitted) and disconnect AC power to the panel by switching the MAIN switch OFF.

STEP 2 Disconnect and mark any field wiring connected to Termination blocks TB1 and TB1.

STEP 3 Remove the four (4) pcb mounting screws.

STEP 4 Unplug the 24 Volt power bus connector P1.

STEP 5 Unplug the expansion bus ribbon connector P2 located on the rear side of the board.

5.4.5 BOARD INSTALLATION

STEP 1 Plug-in the expansion bus ribbon connector P2 located on the rear side of the board.

STEP 2 Plug-in the 24 volt power bus connector P1.

STEP 3 Locate the board over the four pcb mounting posts and mount using the four pcb mounting screws.

STEP 4 Re-connect any field wiring to terminal blocks TB1.

STEP 5 Turn AC power to the panel ON by switching the MAIN switch ON and connect the batteries if fitted.

5.4.6 FUSES

F1 Fuses incoming 24 Volt supply rated @ 1 amp.

6 4 POINT CONTROL CARD

6.1 OVERVIEW

The 4 Point Control Card Assy No. 002-010 provides additional ancillary control outputs above the four outputs contained on the Master Controller Board. Each card contains four (4), 2 amp relay control points. Each relay provides a normally open contact and can be selected for supervised or non-supervised line monitoring.

6.2 SPECIFICATION

Voltage range:	18 to 32 VDC
Current draw:	40mA + 20mA per energised relay @ 28V DC
Number of Outputs:	4 Relay Outputs supervised or unsupervised.
Relay type:	Single Pole Normally Open Contact.
Rating:	2A @ 30V DC or 0.5A @ 120V AC.
Supervision current:	2mA with 10K ohm End of Line Device.
Protection:	Each Output fused @ 2 Amps
Temperature:	-5 deg. to +55 deg. C dry heat. +40 deg. C at 95% relative humidity.
Dimensions:	98mm x 140mm
Terminations:	Screw Terminal blocks maximum wire size 2.5mm^2

6.3 FUNCTIONAL DESCRIPTION

The 4 Point Control card provides four (4) supervised or non-supervised single pole N.O. contacts. Each card occupies a particular address location from 0 to 4. The card address is set via a 4 way DIP switch located on the card. The Master Controller addresses each card via the expansion bus enabling it to control and scan each output for supervision status.

6.3.1 Expansion Bus Interface

The expansion bus interface comprises of input/output expander IC1 and address comparator IC2. All communication with the Master Controller, occurs on port 2 (P20-P23) of IC1 with the timing through the clock input of pin7/IC1 (PROG). Port 4 (P40-P43) is programmed as an input port and via the jumper settings of JB1 determines the card type ie: 8 point monitor card or 4 point control card. Port 5 (P50-P53) is also programmed as an input port and is used for reading the supervision status of each control output via the comparator IC3. Port 6 (P60-P63) is programmed as an output and is used to control each output relay via octal darlington driver IC5.
The 4 way DIP switch SW1 is used to set the card address which is decoded by address comparator IC2 to provide the active low chip select signal for IC1.

The 24V power bus to each card is fused via fuse F5. The on-board voltage regulator VR1 is used to provide a 5 Volt supply to power the expansion bus interface circuits.

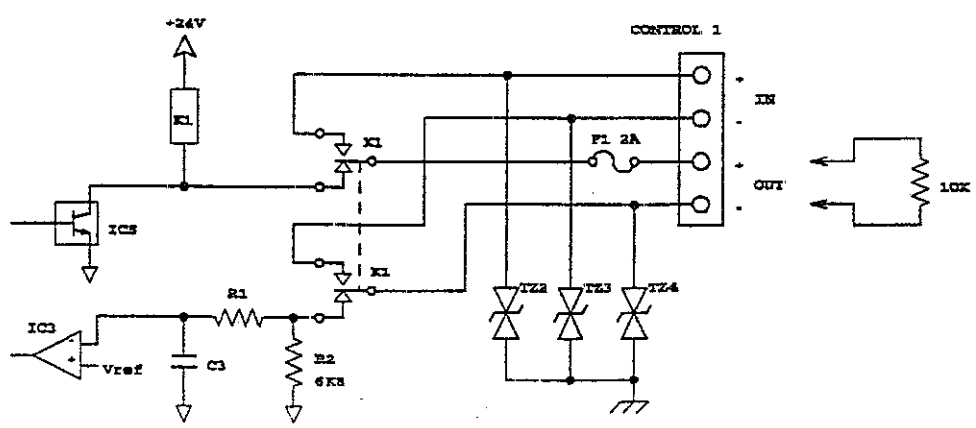
6.3.2 Control Outputs

The four relays K1 - K4 provide a normally open contact for controlling ancillary loads. Supervision is enabled or disabled by inserting the relay to the front or rear of its socket. In either position the relay coils are continuously monitored to ensure they're properly inserted. Each output is protected through an in-line fuse connected in series with the " + OUT" terminal. The fuse is rated @ 2 Amp.

6.3.2.1 Supervised Output

Figure 6.1 shows the circuit configuration of a relay output selected as a supervised output. When supervision is selected a terminating 10K ohm End of Line resistor is required across the 'OUT' terminals. If the device being controlled is not polarised, a diode is required in series with output device to ensure that the supervision current path is through the End of line resistor and not the device.
Under normal quiescent state, relay K1 is de-energised and supervision current flows through the NC contacts of K1, through the 10K ohm end of line resistor and returns via the sense resistor R2. The supervision voltage across the load is in the range 15V-19V DC.
When relay K1 is energised, the relay contacts transfer the voltage at the 'IN' terminals to the 'OUT' terminals. The voltage at the 'IN' terminals must be wired in reverse polarity configuration to ensure that connected load device will operate.

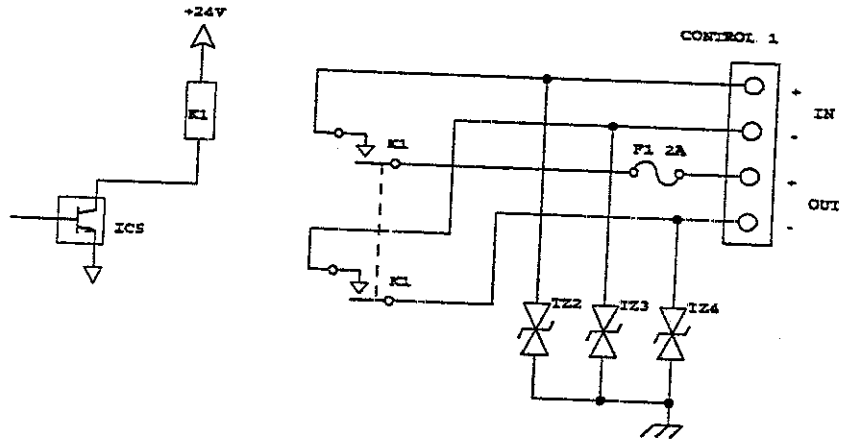
Figure 6.1 - Typical Circuit Supervised Output



6.3.2.2 Unsupervised Output

Figure 6.2 shows the circuit configuration of a relay output selected as a unsupervised output. In this configuration the output is configured as a set of N.O. contacts. The 'IN' terminals being switched to the 'OUT' terminals when the relay is energised.

Figure 6.2 - Typical Output Circuit Unsupervised



Transient protection is provided on each output line via High speed transient suppression devices (TZ2 - TZ4) connected to system earth.

6.4 SERVICING

Servicing of the card is limited to the adjustments set-out below. The card does not contain any field repairable components except fuses. Repair of a faulty card is by card replacement only.

6.4.1 BOARD CONNECTIONS

P2 - Is used to connect the card to the Master Controller Expansion bus.

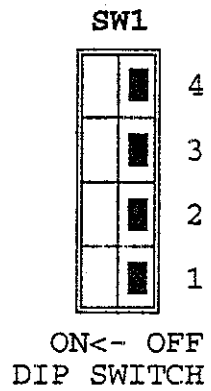
P1 - 24 volt power bus connector.It connects the card to the 28 VDC system supply.

TB1 - Provides field terminations for the four outputs.

End Of Line Resistor: 10K OHM , 1/2W

6.4.2 SWITCH SETTINGS

Dip switch SW1 selects the card address 0 to 4. The following table 6.1 shows the card address and the required switch setting. The first expansion card is always set to address 0 and each additional card is set at the next sequential address.



CARD NO	ADDRESS	SWITCH SETTING | 4 | 3 | 2 | 1 |
1	0	|OFF|OFF|OFF|OFF|
2	1	|OFF|OFF|OFF|ON |
3	2	|OFF|OFF|ON |OFF|
4	3	|OFF|OFF|ON | ON|
5	4	|OFF| ON|OFF|OFF|

TABLE 6.1 SW1 DIP SWITCH SETTINGS

6.4.3 LED INDICATOR

LD1 'CARD ACTIVE' led provided for two purposes. Firstly the led flashes every few seconds to indicate the card has power and is being polled by the CPU. Its second purpose is to indicate the absence of an End Of Line Resistor on one of the zones. When this occurs the led flashes rapidly.

6.4.4 BOARD REMOVAL

STEP 1 Disconnect batteries (if fitted) and disconnect AC power to the panel by switching the MAIN switch OFF.

STEP 2 Disconnect and mark any field wiring connected to Termination blocks TB1 and TB1.

STEP 3 Remove the four (4) pcb mounting screws.

BOARD REMOVAL (Continued)

STEP 4 Unplug the 24 Volt power bus connector P1.

STEP 5 Unplug the expansion bus ribbon connector P2 located on the rear si the board.

6.4.5 BOARD INSTALLATION

STEP 1 Plug-in the expansion bus ribbon connector P2 located on the rear sid the board.

STEP 2 Plug-in the 24 volt power bus connector P1.

STEP 3 Locate the board over the four pcb mounting posts and mount using four pcb mounting screws.

STEP 4 Re-connect any field wiring to terminal blocks TB1.

STEP 5 Turn AC power to the panel ON by switching the MAIN switch ON connect the batteries if fitted.

6.4.6 FUSES

F1 - F4 Fuses each relay output rated @ 2amp

F5 Fuses incoming 24 Volt supply rated @ 0.2 amp.

7 MIMIC - RS232 INTERFACE MODULE

7.1 OVERVIEW

The Mimic/RS-232 Module Assy No. 002-101 provides a serial RS232 port and a Simplex serial Mimic driver port on the same card. Essentially the card is a level converter, converting the 5V signal levels from the dual channel serial port on the Master Controller Card to the required interfacing voltage levels. The RS-232 port is normally configured to drive a serial printer. The serial Mimic port is used to drive Simplex remote serial annunciators (LED Mimics) such as the Simplex Status Command Units (SCU) or 16 Point Graphic Driver cards. The serial mimic port can drive up to 9 remote units over a total distance of 750 meters over a twisted shielded pair cable.

7.2 SPECIFICATION

Voltage range: 18 to 32 VDC

Current draw: 80mA @ 28V DC

Baud Rate:
- Mimic Comms: 1200
- RS-232 Comms: 4800

Communications Voltage Levels:
- Mimic Comms: 0V/+24V
- RS-232 Comms: +/- 9V

Temperature: -5 deg. to +55 deg. C dry heat.
+40 deg. C at 95% relative humidity.

Dimensions: 38mm x 107mm

Terminations: Screw Terminal blocks maximum wire size 2.5mm^2

7.3 FUNCTIONAL DESCRIPTION

The Mimic/RS-232 module provides an serial RS232 port and a Simplex serial Mimic driver port on the same card. Essentially the card is a level converter, converting the 5V signal levels from the dual channel serial port on the Master Controller Card to the required interfacing voltage levels. Connector P1 provides the physical connections for Data signal lines and Power supply bus from the Master Controller board.

7.3.1 RS-232 INTERFACE

IC1 provides the RS-232 level conversion via on-board charge pump voltage converters These convert the +5V input power to the +/- 10V needed to generate the RS-232 output levels. The following interfacing signals are provided TXdata, RXdata, CTS and RTS all signal levels meet EIA RS-232C and CCITT V.28 specification. The connections for interfacing to a serial printer are shown in figure 7.1.

Transorbs V1, V2, V5, V6 provide transient protection on the external RS-232 lines. Termination is via terminal blocks.

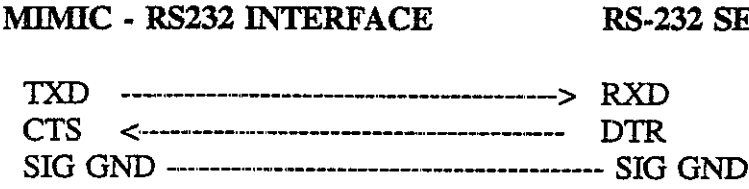


Figure 7.1 Signal Interface to RS-232 Serial Printer

7.3.2 MIMIC INTERFACE

IC U2 ,transistor Q2 and associated circuitry provide the level conversion for the mimic interface line. Half-duplex communication is used - meaning the interface does not transmit/receive simultaneously.

Data is transmitted by alternately turning on or off the "sink" transistor Q2. A logic "1" is sent by turning "off" sink transistor Q2. A logic 0 is sent by turning the sink transistor Q2 "on".

Data is recieved by sensing current pulses across the communication line. These are generated by the responding device shunting 250 ohms across the communication line. A logic "1" is with no current pulses and a logic "0" is when a pulse is detected.

Transient protection is provided from each side to earth via transorbs V3 and V4.

A maximum of nine (9) Remote serial annunciators can be connected in either a daisy chain or star configuration from the interface module. Maximum total wire distance is 750 meters using 1.0mm sq twisted shielded pair cable on the data comms line. An additional pair of wires is also required to supply 24V DC to the remote units.

7.4 SERVICING

There are no service adjustments to be carried out on this card. The card does not contain any field repairable components. Repair of a faulty card is by card replacement only.

7.4.1 BOARD CONNECTIONS

P1 - 16 way header socket used to connect the card to the Master Controller Board via a ribbon cable. The cable carries the serial data signal lines as well as the +24V and +5V power supply bus to operate circuits on the card.

TB1 - Provides field terminations for the Mimic and RS-232 Interface Ports

RS-232 Connections:

TXD Transmitted Data line. Outputs serial data to the remote device.

RXD Receive Data line. Receives serial data from the remote device.

RTS Request To Send line. This line is asserted when data is ready to be accepted from the remote device.

CTS Clear To Send line. This line is used for data flow control (handshaking) from the remote device. When this line is asserted, data will not be transmitted to the remote device.

GND Signal common return .

Mimic Connections:

\+ Positive switching side of serial comms line. Voltage levels 0V/24V

\- Return for serial comms line.

SH Shield termination. The shield is terminated at the 4020 panel end only.

7.4.2 BOARD REMOVAL

STEP 1 Disconnect batteries (if fitted) and disconnect AC power to the panel by switching the MAIN switch OFF.

STEP 2 Disconnect and mark any field wiring connected to Termination blocks TB1.

STEP 3 Remove the four (4) pcb mounting screws.

STEP 4 Unplug the interface ribbon connector from socket P1.

7.4.3 BOARD INSTALLATION

STEP 1 Locate the board over the four pcb mounting posts and mount using the four pcb mounting screws.

STEP 2 Re-connect any field wiring to terminal blocks TB1.

STEP 3 Re-connect the Interface ribbon connector to socket P1.

STEP 4 Turn AC power to the panel ON by switching the MAIN switch ON and connect the batteries if fitted.

8 4020 PARTS LIST

8.1 4020 SUB ASSEMBLIES

ITEM	PART NO.
BATTERY 12V 12Ah	001-137
BATTERY 12V 18Ah	112-A46
BATTERY 12V 7Ah	001-965
BGA FOR FRONT DOOR	2099-0004
BOX	001-947
CABLE TIE (SMALL)	000-520
CABLE TIE BASE	000-751
CFA DOOR (WITH LOCK,MCP,DOOR SEAL)	003-114
CONNECTOR FEMALE SPADE 1/4"	000-384
CONNECTOR FEMALE SPADE 4.8mm	001-944
DOOR (NO WINDOW)	001-984
DOOR (WITH WINDOW)	001-948
DOOR INNER	001-949
FUSE M205 1A	001-379
FUSE M205 3A	001-371
FUSE M205 6.3A	004-003
HARNESS MAIN LOOM (INCL. RES)	003-091
HARNESS 24V 6 1/2"	003-095
HARNESS 24V 11"	003-096
KEYBOARD	001-946
LOCK 003	000-871
LOCK TONGUE	001-974
MANUAL (OPERATING)	001-979
NUT M3	000-457
NUT M4	001-592
PCB ACF EXP.(4 POINT CONTROL CARD)	002-010
PCB AZF EXP.(8 POINT MONITOR CARD)	002-009
PCB CPU - 8 ZONE MASTER CONTROLLER MODULE	002-078
PCB CPU - 4 ZONE MASTER CONTROLLER MODULE	002-103
PCB DISPLAY	002-080
PCB MIMIC & PRINTER (RS232)	002-101
PCB MIMIC & 2120	002-092
PLATE EXPANSION (5 CARD)	001-990
PLUG 2" CABLE ENTRY	001-955
RESISTOR 10K EOL	378-156
RESISTOR 16R FOR 18Ah BATTERIES	001-057
RESISTOR 3K3 EOL	378-193
RIBBON CABLE CLAMP	156-083
RIBBON DISPLAY	003-090

7.1 4020 SUB ASSEMBLY PARTS LIST (continued)

ITEM	PART NO.
RIBBON EXP. (2 CARD)	003-089
RIBBON EXP. (5 CARD)	003-098
SCREW 8BA x 12mm	001-975
SCREW M3 x 12	000-510
SCREW M3 x 6	001-412
SCREW M4 x 15	001-970
SEAL DOOR RUBBER (ROLL)	001-817
SPACER M3 x 10 (DISPLAY)	001-963
SPACER M3 x 20 (PCBS)	001-135
SWITCH ASSY (MAINS)	003-088
SWITCH DOOR MICRO	001-954
THERMAL CUT-OUT	000-896
TRANSFER (LARGE)	001-980
TRANSFER (SMALL)	001-982
WASHER 8BA STAR	001-976
WASHER M3 FLAT	001-977
WASHER M3 STAR	001-764
WASHER M4 FLAT	490-010
WASHER M4 STAR	268-010
WINDOW (PERSPEX)	001-950
XFORMER ASSY. 150VA	4020-8990
XFORMER ASSY. 50VA	003-093

8.2 8 ZONE MASTER CONTROLLER PART NO:002-078

Bill of Materials

Quan	Part Number	Value	Ref Designators
1	000-633	IC 27C256	U2
1	246-329	IC 32KX8RAM	U4
1	001-719	IC 28C64	U3
1	001-907	IC 80C552	U1
1	000-432	BRIDGE BR106	BR1
1	001-100	BRIDGE BR64	BR2
1	000-998	BRIDGE W04	BR3
5	146-034	CAP 0.1uF	C19,C20,C21,C26,C27
2	000-148	CAP 15pF	C22,C28
1	000-984	CAP 10pF	C23
2	000-983	CAP 33pF	C24,C25
1	001-771	IC CD4051BD	U10
1	001-983	CRYSTAL 16MHZ	Y1
1	001-917	CRYSTAL 3.6864MHZ	Y2
1	001-345	CRYSTAL 32.768KHZ	Y3
1	184-011	DIODE IN4004	D1
16	184-026	DIODE 1N4148	D10,D11,D12,D13,D14,D15, D16,D17,D19,D3,D4,D5,D6, D7,D8,D9
1	001-553	DIODE NETWK COM AN	DN2
1	001-552	DIODE NETWK COM CA	DN1
1	FUSE	1A/2A	F1
1	FUSE	3A/6A	F2
2	001-372	FUSE 2A	F3,F6
1	001-379	FUSE 1A	F4
1	001-055	LED GREEN	LD1
1	001-053	LED RED	LD2
1	000-957	REG LM7805	VR1
1	001-030	REG LM317LZ	VR2
1	000-577	IC LM358AN	U13
1	001-902	IC MAX691	U14
2	001-152	NPN PN100	Q1,Q3
1	001-378	PUSH BUTTON	PB1
1	001-906	IC PCF8583	U11
1	001-153	IC PCF8591	U12
1	001-153	PNP PN200	Q2
1	001-642	CAP 10000uF	C1
14	148-088	CAP 6u8	C11,C12,C13,C14,C15,C16, C17,C18,C4,C5,C6,C7,C8,
1	001-922	CAP 2200uF 50VW	C2
1	001-903	CAP 0.047F	SC1
1	001-643	POT 20K	RV1
1	001-649	REF IC LM336Z-5	VRF1
3	001-574	RELAY VS-24	K1,K6,K8
5	001-370	RELAY RY-24	K2,K3,K4,K5,K7
1	378-150	RES 2K2	R1
1	001-170	RES 6K8	R12
1	000-476	RES 8K2	R10
2	378-165	RES 100K	R11,R26
1	004-143	RES 24K	R14
3	000-987	RES 22K	R28,R30
2	378-159	RES 10K	R15,R5
2	378-148	RES 1K	R16,R13
8	001-916	RES 390R 5W	R17,R18,R19,R20,R21,R22, R23,R24

Quan	Part Number	Value	Ref Designators
1	378-152	RES 3K9	R2
3	378-180	RES 4K7	R25,R6,R9
1	378-161	RES 47K	R27
3	378-159	RES 27K	R29,R7,R8
1	000-178	RES 220R	R3
1	001-390	RES 0.1R	R4
1	001-202	RESNET 6PIN COM 10K	RN2
1	001-921	RESNET 10P COM 3K3	RN5
3	001-920	RESNET 8P ISO 22K	RN3,RN6,RN7
1	001-200	RESNET 10P COM 10K	RN1
1	001-921	RESNET 9P COM 3K3	RN4
1	001-942	IC 74HC139N	U5
1	001-919	IC 74HC573N	U6
1	001-565	IC UCN5820A	U9
1	001-886	IC UCN5891A	U8
20	463-004	VARISTOR 39V	V1,V10,V11,V12,V13,V14, V15,V16,V17,V18,V19,V2, V20,V3,V4,V5,V6,V7,V8,
1	001-644	RES TRIM 1K	RV2
1	001-909	IC XR88C681	U7
1	001-164	ZENER 30V	SD1

NOTE: Unless otherwise specified all resistors are 1/4 Watt.
" " " all capacitors are rated at 35V

8.3 LCD DISPLAY PART NO:002-080

Bill of Materials

Quan	Part	Value	Ref Designators
1	000-633	IC 27C256	U2
1	000-459	IC 6264A	U3
1	001-907	IC 80C552	U1
1	130-017	BUZZER YMB-24	B1
2	000-983	CAP 33pF	C1,C2
5	146-034	CAP 0.1uF	C4,C5,C6,C7,C8
1	001-932	CAP 0.0033uF	C9
1	001-217	CAP 0.01uF	CX1
1	001-983	CRYSTAL 16MHz	Y1
1	184-011	DIODE 1N4004	D1
1	000-944	LED RED	LD1
4	000-242	LED YEL	LD2,LD3,LD4,LD6
1	000-299	LED GRN	LD5
1	000-957	LM340-5T	VR1
1	XXX-XXX	NOT USED	U7
1	001-924	PIEZO KP152	B2
1	148-088	CAP 6.8uF	C10
1	001-065	CAP 220uF	C3
1	001-059	POT 20K	TR1
1	000-615	RES 56K	R1
6	378-150	RES 2K2	R10,R5,R6,R7,R8,R9
5	378-156	RES 10K	R11,R12,R2,R3,RX1
1	378-180	RES 4K7	R13
1	001-929	RES 100R 10W	R4
1	001-202	RES NETWORK 10K	RN1
1	001-210	IC 74HC138	U6
1	001-919	IC 74HC573	U4
1	001-565	IC UCN5820A	U5

NOTE: Unless otherwise specified all resistors are 1/4 Watt.
" " " all capacitors are rated at 35V

8.4 8 POINT MONITOR CARD (AZF EXPANSION MODULE) PART NO:002-009A

Bill of Materials

Quan	Part Number	Value	Ref Designators
1	001-104	IC 74HC157	IC8
1	001-077	IC CD4724	IC7
1	001-208	IC 74HC85	IC2
1	001-207	IC 82C43	IC1
11	146-034	CAP 0.1uF	C1,C10,C11,C2,C3,C4,C5, C12
1	001-090	CAP 100uF	
8	184-026	DIODE 1N4148	D1,D2,D3,D4,D5,D6,D7,D8
1	001-553	DIODE NETWORK CA	DN1
1	001-379	FUSE 1A	F1
1	001-055	LED GREEN	LD1
2	001-204	IC LM339	IC3,IC4
1	001-206	REG LM7805LZ	VR1
2	001-152	NPN PN100	Q1,Q2
1	001-153	PNP PN200	Q3
8	001-281	RES 390R-5W	R1,R2,R3,R4,R5,R6,R7,R8
8	000-986	RES 1M	R10,R12,R14,R16,R18,R20, R22,R24
9	378-165	RES 100K	R11,R13,R15,R17,R19,R21, R23,R25,R9
1	378-161	RES 47K	R26
1	001-089	RES 470R	R27
2	001-200	RES NETWORK 10K	RN1,RN2
1	000-742	SW 4 POS DIL	SW1
10	001-164	TZORB 47V	TZ1,TZ10,TZ2,TZ3,TZ4, TZ5,TZ6,TZ7,TZ8,TZ9
1	001-564	IC UDN2981A	IC6

NOTE: Unless otherwise specified all resistors are 1/4 Watt.
" " " all capacitors are rated at 35V

8.5 4 POINT CONTROL CARD (ACF EXPANSION MODULE) PART NO:002-010

Bill of Materials

Quan	Part Number	Value	Ref Designators
1	001-208	IC 74HC85	IC2
1	001-207	IC 82C43	IC1
7	146-034	CAP 0.1uF	C2,C3,C4,C5,C6,C7,C8
1	001-090	CAP 100uF	C1
4	184-026	DIODE 1N4148	D1,D2,D3,D4
4	001-372	FUSE 2A	F1,F2,F3,F4
1	001-521	FUSE 0.2A	F5
1	001-055	LED GREEN	LD1
1	001-204	IC LM339	IC3
1	001-206	IC LM7805LZ	VR1
4	001-370	RELAY-M4	K1,K2,K3,K4
4	378-165	RES 100K	R1,R10,R4,R7
4	000-170	RES 6K8	R11,R2,R5,R8
4	000-372	RES 150K	R12,R3,R6,R9
1	001-089	RES 470R	R13
1	001-200	RES NETWORK 10K	RN1,RN2
1	000-742	4 POS DIP SW	SW1
2	001-164	TZORB 47V	TZ1,TZ14
12	001-325	TZORB 160V	TZ2,TZ3,TZ4,TZ5,TZ6, TZ7,TZ8,TZ9,TZ10,TZ11, TZ12,TZ13
1	001-048	IC UDN2003	IC5

NOTE: Unless otherwise specified all resistors are 1/4 Watt.
" " " all capacitors are rated at 35V

8.6 MIMIC - RS232 INTERFACE PART NO: 002-101

Bill of Materials

Quan	Part Number	Value	Ref Designators
2	146-034	CAP 0.1uF	C10,C2
1	000-414	CAP 22pF	C4
3	184-026	DIODE 1N4148	D4,D5,D6
1	246-292	IC LM393AHC	U2
1	001-173	IC MAX232	IC1
1	480-086	TRANSISTOR MPS8098	Q2
1	000-555	CAP 100uF	C1
1	001-123	CAP 0.47uF	C3
5	000-558	CAP 1uF	C5,C6,C7,C8,C9
1	000-180	RES 180R	R1
1	378-152	RES 3K9	R2
2	378-161	RES 47K	R3,R6
1	000-153	RES 270K	R4
1	000-169	RES 39K	R5
1	378-180	RES 4K7	R7
1	000-372	RES 150K	R8
1	001-916	RES 390R	R9
6	463-004	VARISTOR 39V	V1,V2,V3,V4,V5,V6

NOTE: Unless otherwise specified all resistors are 1/4 Watt.
" " " all capacitors are rated at 35V

APPENDIX A

4020 INTERCONNECTION DIAGRAM

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APPENDIX B

LIST OF INSTALLED DEVICES

APPENDIX B - LIST OF INSTALLED DEVICES

AZF ZONE NUMBER	DEVICE TYPE	QUANTITY INSTALLED
AZF 1		
AZF 2		
AZF 3		
AZF 4		
AZF 5		
AZF 6		
AZF 7		
AZF 8		
AZF 9		
AZF 10		
AZF 11		
AZF 12		
AZF 13		
AZF 14		
AZF 15		
AZF 16		
AZF 17		
AZF 18		
AZF 19		
AZF 20		
AZF 21		
AZF 22		
AZF 23		
AZF 24		
AZF 25		
AZF 26		
AZF 27		
AZF 28		

APPENDIX B - LIST OF INSTALLED DEVICES (CONTINUED)

AZF ZONE NUMBER	DEVICE TYPE	QUANTITY INSTALLED
AZF 29		
AZF 30		
AZF 31		
AZF 32		
AZF 33		
AZF 34		
AZF 35		
AZF 36		
AZF 37		
AZF 38		
AZF 39		
AZF 40		
AZF 41		
AZF 42		
AZF 43		
AZF 44		
AZF 45		
AZF 46		
AZF 47		
AZF 48		

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APPENDIX C

4020 FIELD WIRING DIAGRAM

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APPENDIX D

4020 CIRCUIT DIAGRAMS

MODULE	ASSY NUMBER
4020 MASTER CONTROLLER	002-078
4020 LCD DISPLAY BOARD	002-080
4020 8 POINT MONITOR CARD	002-009
4020 4 POINT CONTROL CARD	002-010
4020 MIMIC-RS232 INTERFACE CARD	002-101

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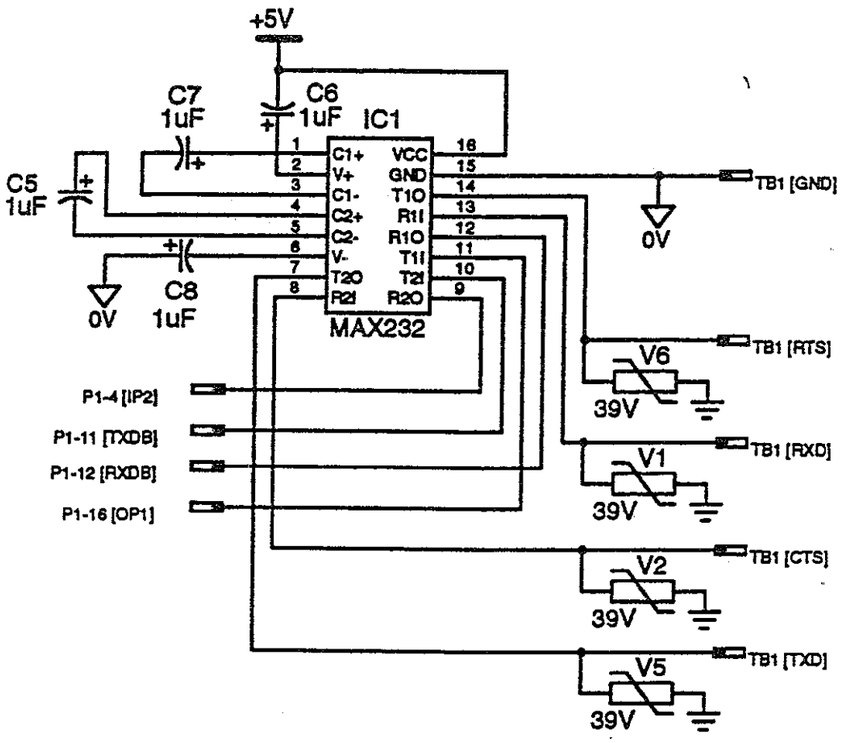
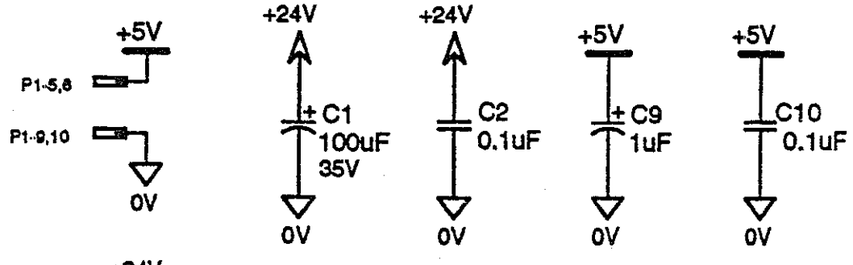




NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL CAPACITORS 35VW MIN.
2. UNLESS OTHERWISE SPECIFIED ALL RESISTORS 0.25W 5%

Rev	Description	Date

SIMPLEX AUSTRALIA

Title: 4020 MIMIC - RS232 INTERFACE		
Size: A4	Number: ASSY No. 002-101	Rev:
Date: 1/7/92		Drawn by: S.G
Filename: 002-101.S01		Sheet 1 of 1

4020-0804 CONNECTION DIAGRAM

SIZE	DWG No.	REV
A3	000-021-S	
REV	ORN/ECO	DATE	CHK

24V DC
FIELD SUPPLY TO
EXTERNAL DEVICES

10K 0.5W

NOTE 3
USE POLARISED
DEVICES

NOTE 1

NOTE 1

DOOR SWITCH

FIP MCP

ELD ELD ELD ELD ELD ELD ELD ELD

TB2: 24VDC | FAULT | BELL ACF1 | ALARM ACF2 | ACF3 | ACF4 | DOOR — JP1

TB1: MAN CALL PT OUT/IN | ZONE 1 | ZONE 2 | ZONE 3 | ZONE 4 | ZONE 5 | ZONE 6 | ZONE 7 | ZONE 8

F5 2A

F4 1A

24V EXTERNAL

NC NO — FAULT

BELL

NO NC — ALARM

NO NC — ACF3

NO NC — ACF4

C28

RV2

RV1

JP2

MASTER CONTROLLER BOARD

U1 CPU 80C552

U2 EPROM

U3 EEPROM

U4 RAM

U7 UART

AC INPUT
3A OR 6A

F1

F2 2A — BATTERY CHARGER

BOOST CHARGE LD2

PWR ON LD1

F3 2A — INTERNAL 24V SUPPLY

BATTERY

P1 20V 30V P2 — P3 — P4 24VDC

PB1 CPU RESET

P5

P6

TO EXPANSION CARDS

A N — Tx

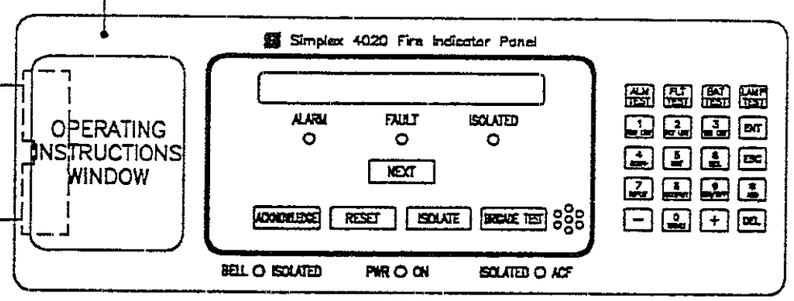
E

THERMAL CUT-OUT

BATTERY TEST RESISTOR

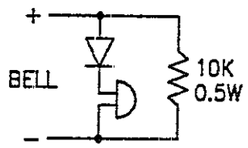
RIBBON CABLE
FROM P5 ON MASTER CONTROLLER BOARD
TO P1 ON LCD DISPLAY/KEYBOARD

LCD DISPLAY/
KEYBOARD



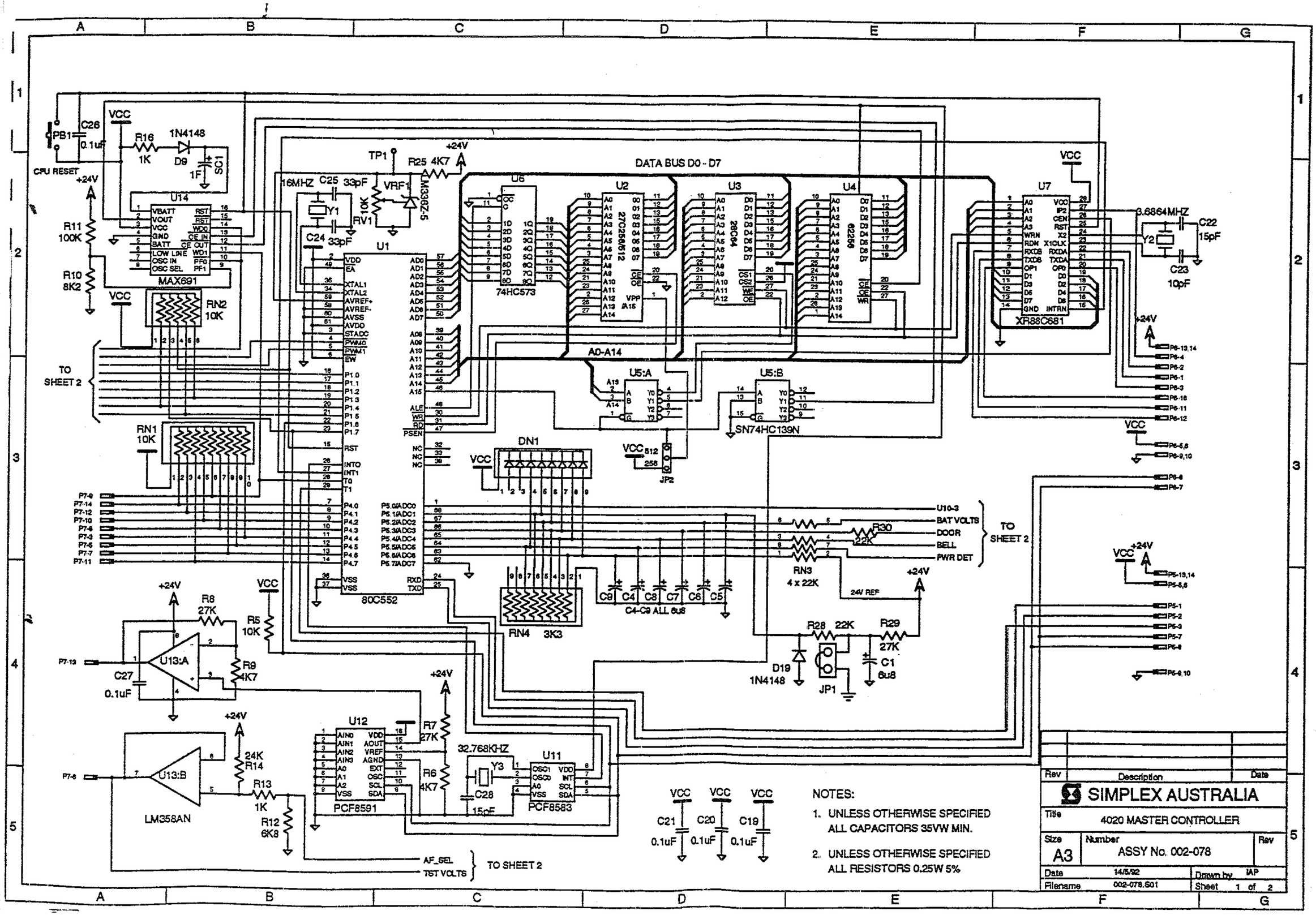
NOTES:

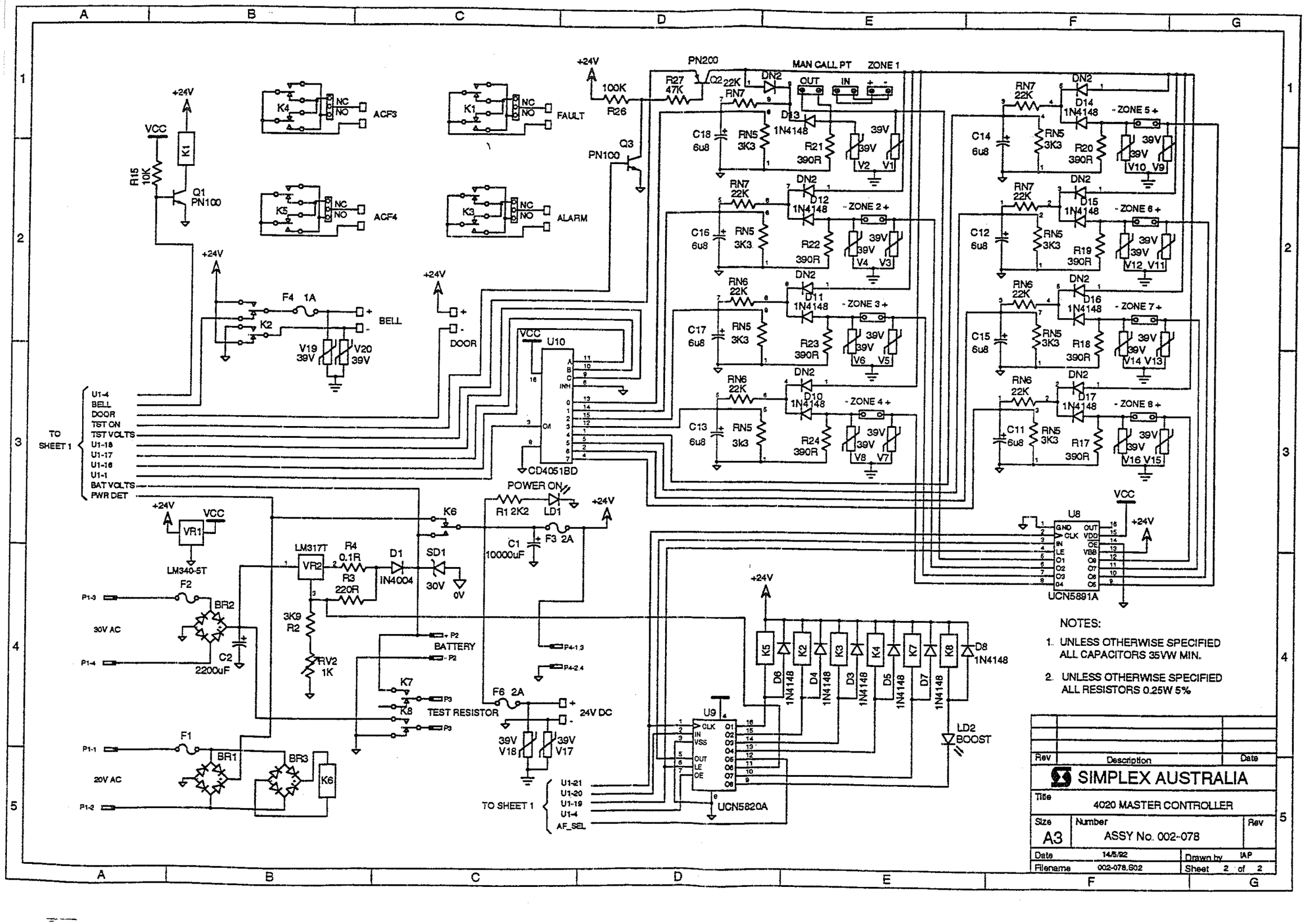
1. VOLTAGE FREE RELAY CONTACTS 2A @ 30V DC FOR BRIGADE INTERFACE IF REQUIRED
2. ALL ELD TO BE 3K3, 0.25W RESISTORS
3. FOR NON POLARISED DEVICES CONNECT BLOCKING DIODE AS SHOWN BELOW

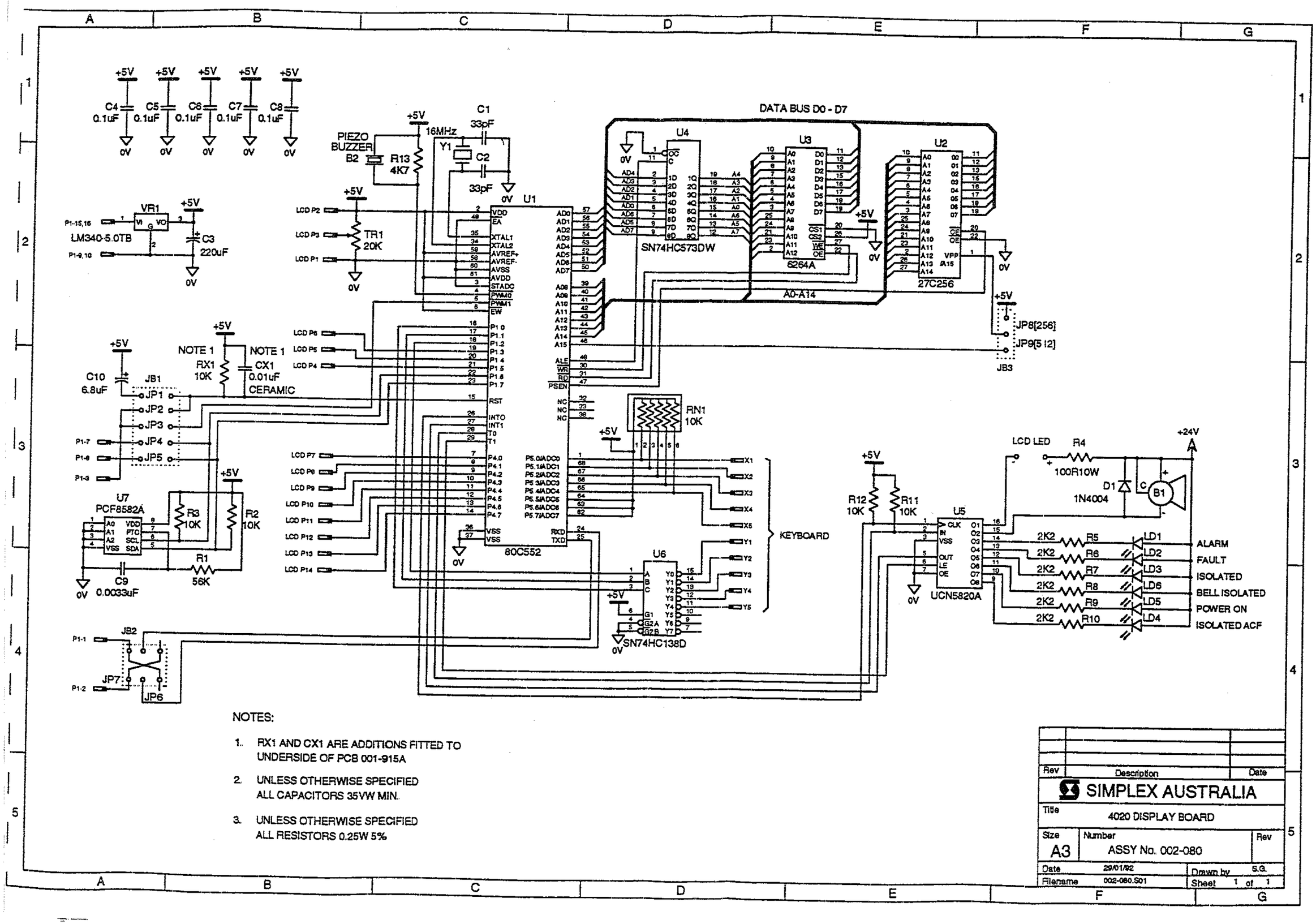


QTY	DESCRIPTION	PART No.

NEXT ASSY	DRAFTSMAN S.G. DATE DEC '92	Simplex AUSTRALIA
	CHECKER G.F. DATE DEC '92	TITLE FIELD WIRING DIAGRAM
SCALE NONE	APPROVED DATE	EQUIP 4020-0804
	DO NOT SCALE DRAWING ALL DIMENSIONS IN mm	SIZE A3 DWG No. 000-021 SHEET 1 OF 1 REV


DATA BUS D0 - D7
A0-A14
CPU RESET
PB1
C26
0.1uF
R16
1K
1N4148
D9
SC1
1F
VCC
+24V
U14
MAX691
R11
100K
R10
8K2
RN2
10K
TO
SHEET 2
RN1
10K
TP1
R25 4K7
16MHZ
C25 33pF
Y1
C24 33pF
VRF1
10K
RV1
LM336Z-5
U1
80C552
U6
74HC573
U2
27C256/512
U3
28C64
U4
62256
U7
XR88C681
3.6864MHZ
Y2
C22
15pF
C23
10pF
U5:A
U5:B
SN74HC139N
JP2
DN1
RN4 3K3
C9 C4 C8 C7 C6 C5
C4-C9 ALL 6u8
U10-3
BAT VOLTS
DOOR
BELL
PWR DET
R30
22K
RN3
4 x 22K
24V REF
R28 22K
R29
27K
D19
1N4148
JP1
C1
6u8
R8
27K
R5
10K
U13:A
C27
0.1uF
R9
4K7
U13:B
LM358AN
24K
R14
R13
1K
R12
6K8
U12
PCF8591
R7
27K
R6
4K7
32.768KHZ
Y3
C28
15pF
U11
PCF8583
C21 C20 C19
0.1uF
AF_SEL
TST VOLTS
TO SHEET 2
NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL CAPACITORS 35VW MIN.
2. UNLESS OTHERWISE SPECIFIED ALL RESISTORS 0.25W 5%
Rev
Description
Date
SIMPLEX AUSTRALIA
Title
4020 MASTER CONTROLLER
Size
A3
Number
ASSY No. 002-078
Rev
Date
14/5/92
Drawn by
IAP
Filename
002-078.S01
Sheet
1 of 2


ACF3
ACF4
FAULT
ALARM
BELL
DOOR
F4 1A
F1
F2
F3 2A
F6 2A
BR1
BR2
BR3
C1 10000uF
C2 2200uF
R1 2K2
R2 3K9
R3 220R
R4 0.1R
R15 10K
R26 100K
R27 47K
RV2 1K
LD1
LD2 BOOST
D1 IN4004
SD1 30V
VR1
VR2
LM340-5T
LM317T
30V AC
20V AC
BATTERY
TEST RESISTOR
24V DC
POWER ON
PN100
PN200
MAN CALL PT
ZONE 1
ZONE 2
ZONE 3
ZONE 4
ZONE 5
ZONE 6
ZONE 7
ZONE 8
CD4051BD
UCN5820A
UCN5891A
TO SHEET 1
U1-4
U1-18
U1-17
U1-16
U1-1
BAT VOLTS
PWR DET
U1-21
U1-20
U1-19
AF_SEL
NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL CAPACITORS 35VW MIN.
2. UNLESS OTHERWISE SPECIFIED ALL RESISTORS 0.25W 5%
Rev
Description
Date
SIMPLEX AUSTRALIA
Title
4020 MASTER CONTROLLER
Size
A3
Number
ASSY No. 002-078
Rev
Date
14/5/92
Drawn by
IAP
Filename
002-078.S02
Sheet 2 of 2



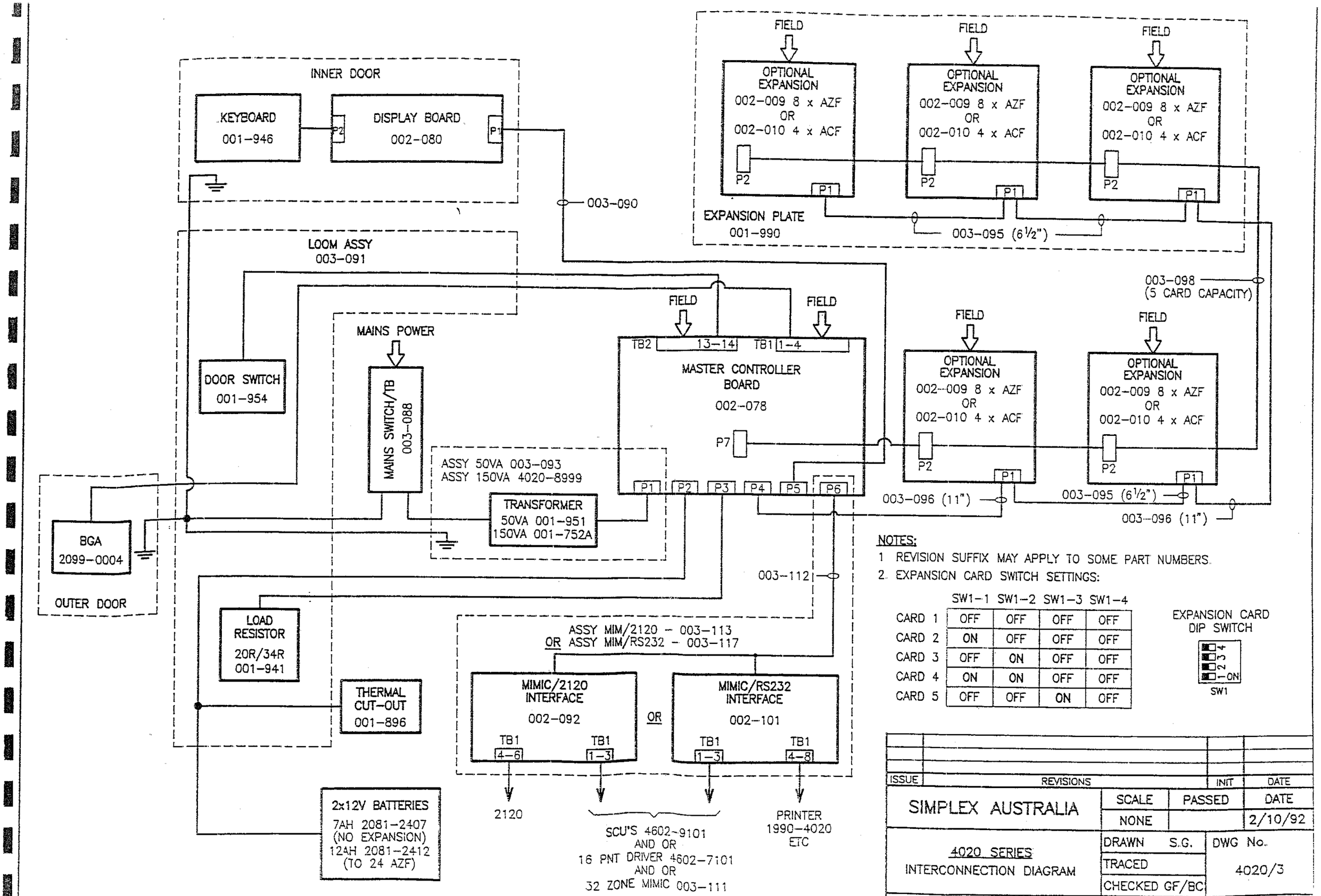
NOTES:

1. RX1 AND CX1 ARE ADDITIONS FITTED TO UNDERSIDE OF PCB 001-915A
2. UNLESS OTHERWISE SPECIFIED ALL CAPACITORS 35VW MIN.
3. UNLESS OTHERWISE SPECIFIED ALL RESISTORS 0.25W 5%

Rev	Description	Date

SIMPLEX AUSTRALIA

Title: 4020 DISPLAY BOARD		
Size: A3	Number: ASSY No. 002-080	Rev:
Date: 29/01/92	Drawn by: S.G.	
Filename: 002-080.S01	Sheet 1 of 1	



NOTES:

1. REVISION SUFFIX MAY APPLY TO SOME PART NUMBERS.
2. EXPANSION CARD SWITCH SETTINGS:

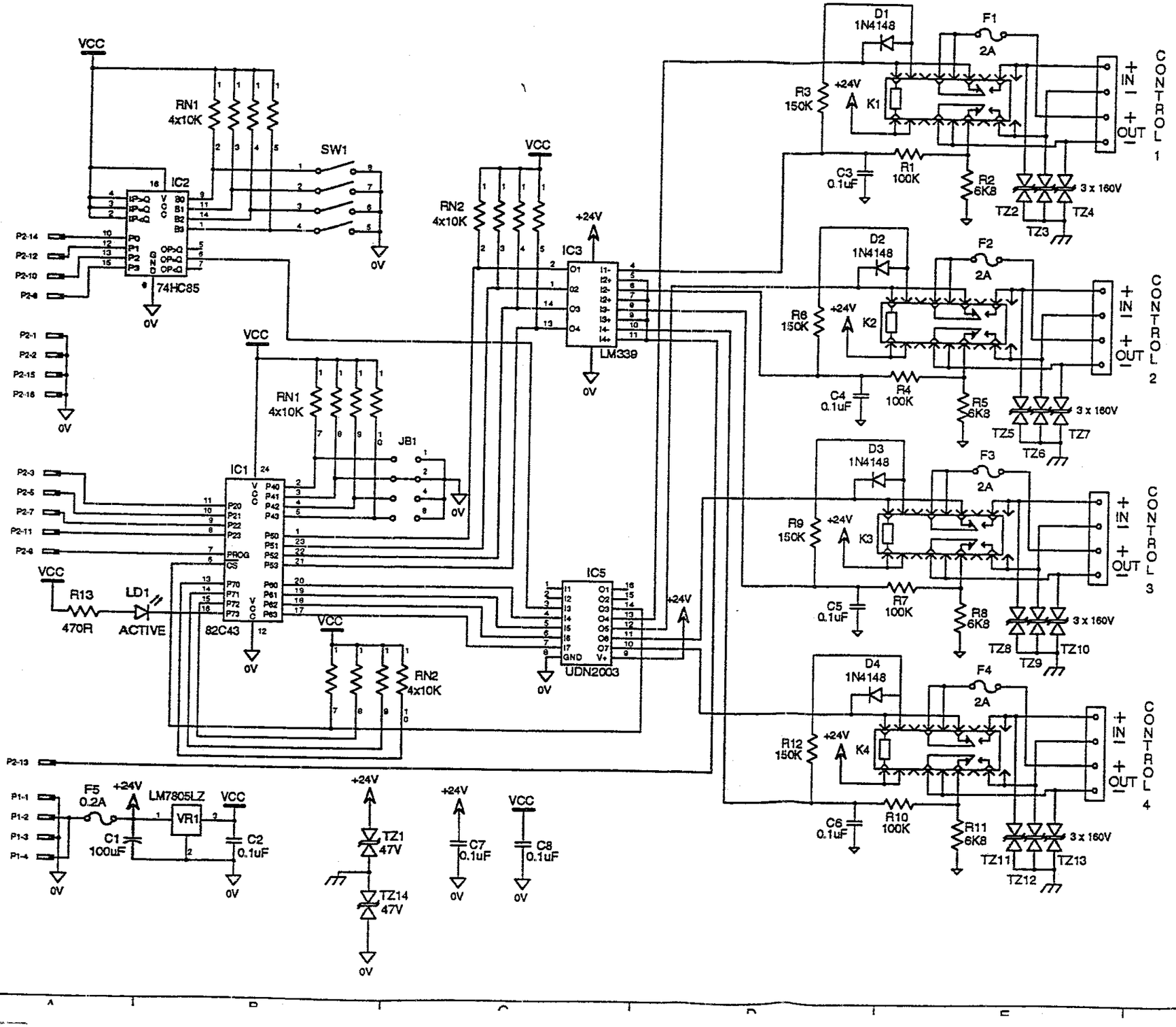
	SW1–1	SW1–2	SW1–3	SW1–4
CARD 1	OFF	OFF	OFF	OFF
CARD 2	ON	OFF	OFF	OFF
CARD 3	OFF	ON	OFF	OFF
CARD 4	ON	ON	OFF	OFF
CARD 5	OFF	OFF	ON	OFF

EXPANSION CARD DIP SWITCH

ISSUE	REVISIONS	INIT	DATE

SIMPLEX AUSTRALIA	SCALE	PASSED	DATE
	NONE		2/10/92
4020 SERIES INTERCONNECTION DIAGRAM	DRAWN S.G.		DWG No. 4020/3
	TRACED		
	CHECKED GF/BC		

ACAD FILE NUMBER: 4020_3.DWG



NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL CAPACITORS 35VW MIN.
2. UNLESS OTHERWISE SPECIFIED ALL RESISTORS 0.25W 5%

Rev	Description	Date

SIMPLEX AUSTRALIA

Title	ET2/4020 4 POINT CONTROL	
Size A3	Number ASSY No. 002-010	Rev
Date 20/11/92	Drawn by S.G.	
Filename 002-010.S01	Sheet 1 of 1	

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NOTES

NOTES