

- RACK CONNECTIONS**
- A1 - P/5 (ORANGE 0.15)
 - P/5 - BUS I/3 (RED)
 - A2 - P/5 (RED)
 - P/5 - BUS I/6 (GREEN/YELLOW)
 - A3 - P/5/11 (GREEN/YELLOW)
 - P/5/11 - P/5/9 (GREEN/YELLOW)
 - A3 - SCREEN FROM 4 CORE BELLOW (GREEN/YELLOW)
 - P/5/8 - BUS T/1 (YELLOW/0.75)
 - P/5/4 - BUS T/4 (YELLOW/0.75)
 - P/5/32 - A/4 (GREEN 4 CORE)
 - A5 - P/5 29 & 31 (BLUE)
 - A6 - P/5 26 & 28 (RED)
 - C1 - Z/4 (PURPLE 0.75)
 - C2 - Z/2 (BLUE)
 - C3 - Z/6 (GREEN)
 - C4 - Z/8 (YELLOW)
 - C5 - X/4 (ORANGE)
 - C6 - X/2 (RED)
 - C7 - X/6 (BROWN)
 - C8 - X/8 (BLACK)

- RED 2 CORE SOLEVED**
- B1 - X/1
 - B2 - X/2
 - B3 - X/3
 - B4 - X/4
 - B5 - X/5
 - B6 - X/6
 - B7 - X/7
 - B8 - Z/32
 - X32 - X/16 & 18
 - X/16 - Z/16
 - B9 - Z/12 & 14
 - B10 - X/12 & 14
- RED 0.75**
- B1 - X/1
 - B2 - X/2
 - B3 - X/3
 - B4 - X/4
 - B5 - X/5
 - B6 - X/6
 - B7 - X/7
 - B8 - Z/32
 - X32 - X/16 & 18
 - X/16 - Z/16
 - B9 - Z/12 & 14
 - B10 - X/12 & 14
- BLACK 1.5**
- B1 - X/1
 - B2 - X/2
 - B3 - X/3
 - B4 - X/4
 - B5 - X/5
 - B6 - X/6
 - B7 - X/7
 - B8 - Z/32
 - X32 - X/16 & 18
 - X/16 - Z/16
 - B9 - Z/12 & 14
 - B10 - X/12 & 14
- RED**
- B1 - X/1
 - B2 - X/2
 - B3 - X/3
 - B4 - X/4
 - B5 - X/5
 - B6 - X/6
 - B7 - X/7
 - B8 - Z/32
 - X32 - X/16 & 18
 - X/16 - Z/16
 - B9 - Z/12 & 14
 - B10 - X/12 & 14
- BROWN**
- B1 - X/1
 - B2 - X/2
 - B3 - X/3
 - B4 - X/4
 - B5 - X/5
 - B6 - X/6
 - B7 - X/7
 - B8 - Z/32
 - X32 - X/16 & 18
 - X/16 - Z/16
 - B9 - Z/12 & 14
 - B10 - X/12 & 14
- Notes:**
 SO5 EACH LINE ACROSS MOTHER BOARD ON X & Z. CUT OFF PINS 20, 22, 24, 30 (B) CUT REMAINING PINS HALF-WAY DOWN. JOIN TOGETHER BOTH PINS AT 2, 4, 6, 8, 10, 26, 28, 30 JOIN TOGETHER 4 PINS AT 12, 14 & 16, 18 AS SHOWN ABOVE.

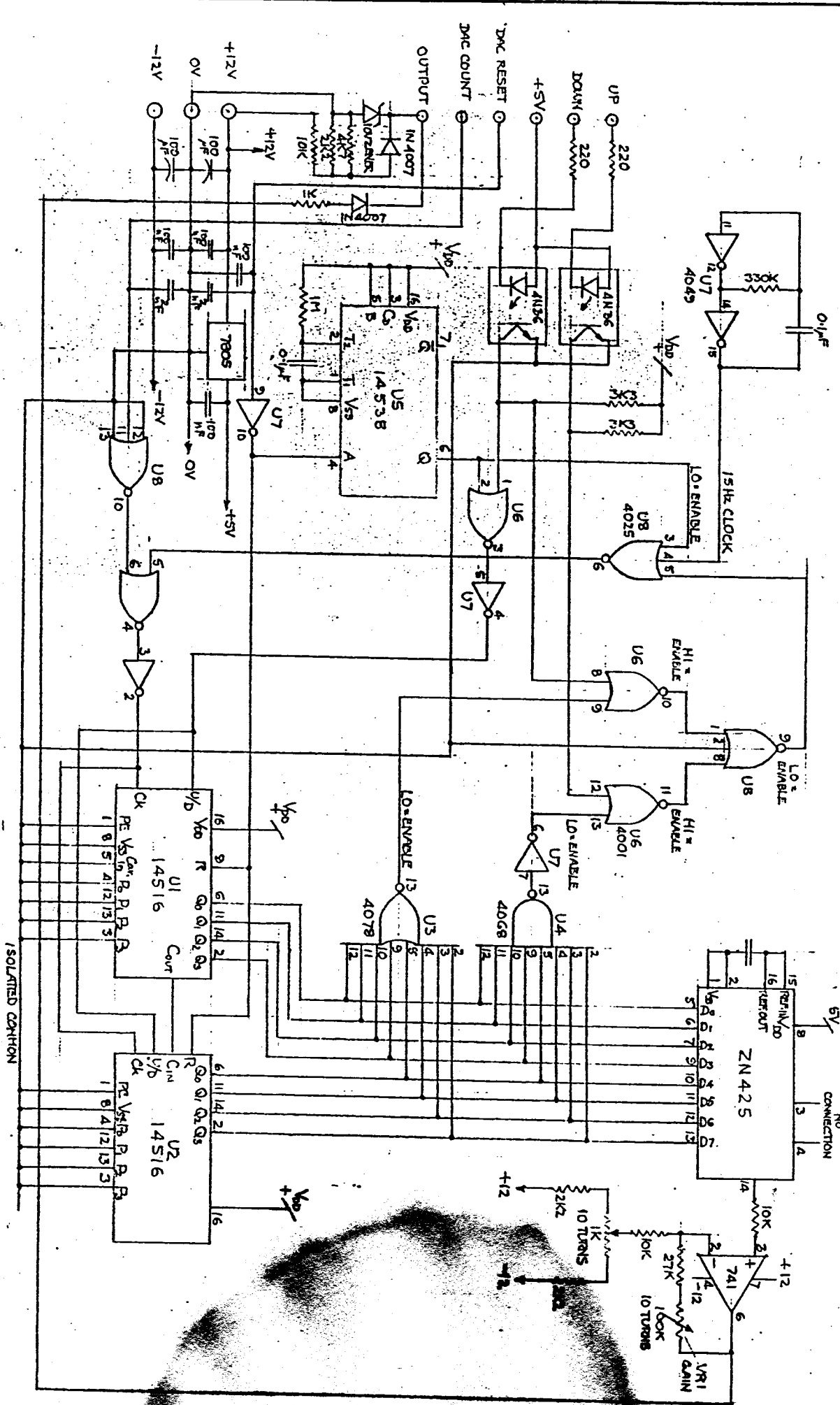
REVISIONS & WPT CHANGES PLUG-T1
 ADDED - 10.8.85

HALF SCALE

JOB	CODE
DRN	35
CRD	

GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS HILL ROAD,
 RIDGERSFIELD,
 WYOMBS HON BY

DRG No.
M1612



REVISIONS

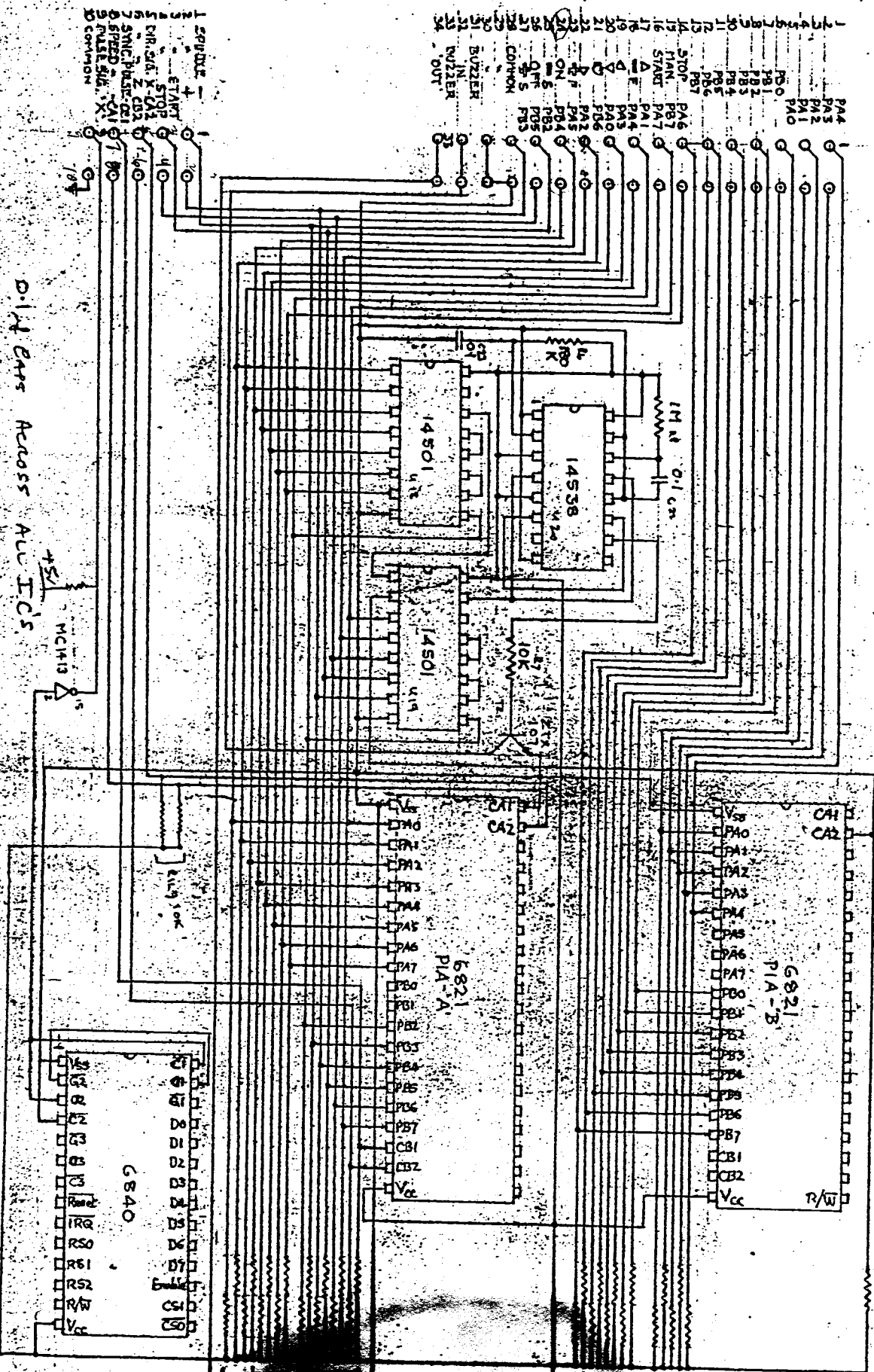
TITLE

CIRCUIT DIAGRAM FOR ORAC SPINDLE SPEED OVERRIDE BOARD - PC 1623

JOB CODE	DRAWN	CHECKED
	J.S.S.	

GSN ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEEN'S HILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3JF

DRG. No. M1667



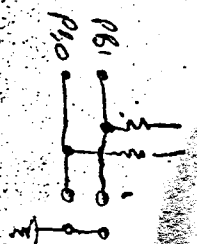
0.1uF Caps Across ALL ICs

CIRCUIT DIAGRAM FOR MK2-TIO'B BOARD WITH R/FBFBZ AND R/FBFAZ

JOB	
COOE	
DNN	Y.R.
GNO	

GSH ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS
 QUEENS HILL ROAD,
 HUDDERSFIELD

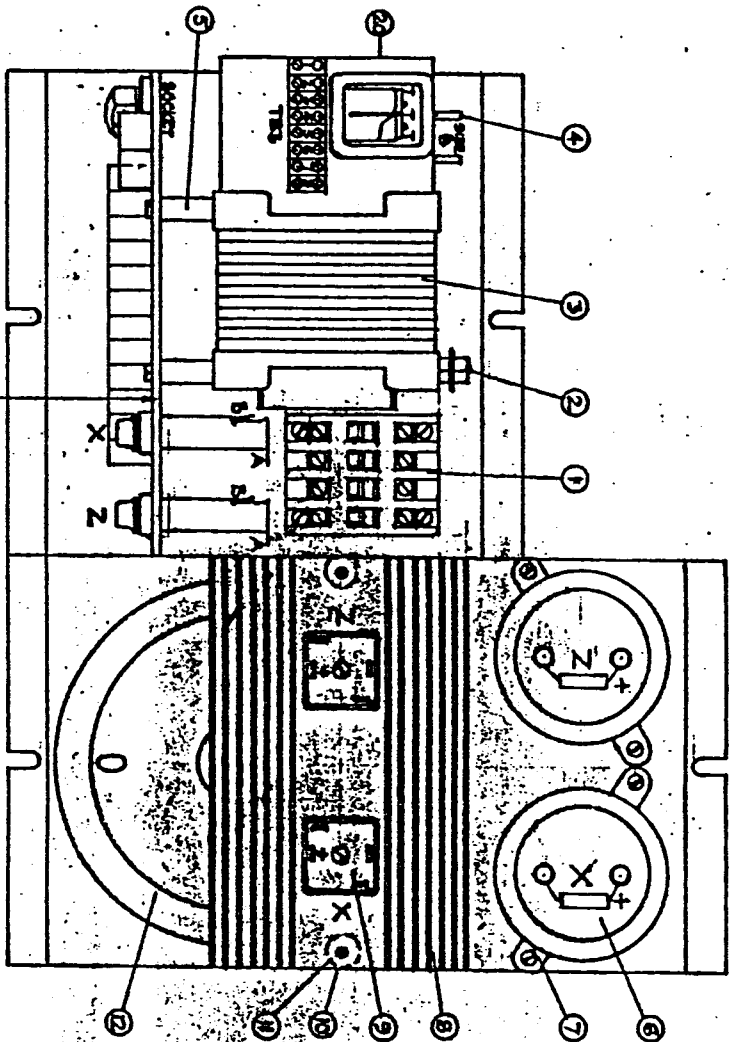
DWG. No. **M1669**



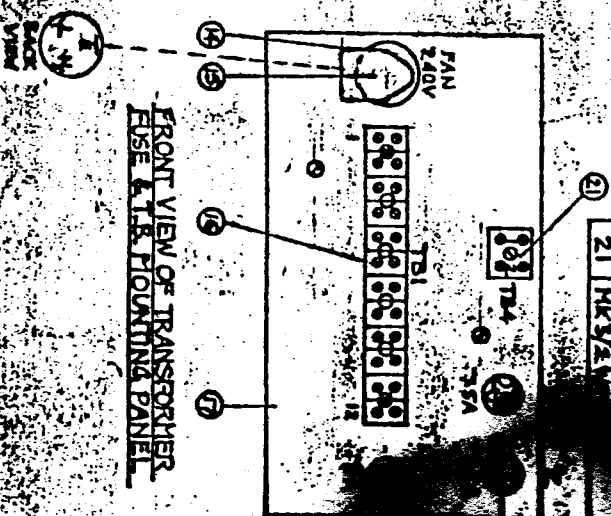
REVISIONS

- 1 SPURTS -
- 2 STOP
- 3 CR
- 4 CR. START
- 5 CR. STOP
- 6 CR. START
- 7 SYNC
- 8 SPEED
- 9 PULSE
- 10 COMMON

- 1 PA4
- 2 PA3
- 3 PA2
- 4 PA1
- 5 PA0
- 6 PB0
- 7 PB1
- 8 PB2
- 9 PB3
- 10 PB4
- 11 PB5
- 12 PB6
- 13 PB7
- 14 STOP
- 15 MAN.
- 16 START
- 17 PA7
- 18 PA6
- 19 PA5
- 20 PA4
- 21 PA3
- 22 PA2
- 23 PA1
- 24 PA0
- 25 ON
- 26 OFF
- 27 SP. S
- 28 COMMON
- 29 BURSTER
- 30 BURSTER
- 31 BURSTER
- 32 BURSTER
- 33 'OUT'



FOR DETAILS OF TRANSFORMER HOUSING PANEL, SEE ON RIGHT



FRONT VIEW OF TRANSFORMER FUSE & T.B. MOUNTING PANEL

ITEM NO.	DESCRIPTION	QTY	UNIT
1	BRASS PLATE	1	PLATE
2	2BA X 7/8 EACH STUD	1	STUD
3	CONTROL TRANSFORMER	1	TRANSFORMER
4	WINDING FILLET	1	FILLET
5	4BA X 5/8 INS. PILLARS	4	PILLARS
6	10000 F/1000C CAPACITOR	2	CAPACITOR
7	25 CAPACITOR CLIP	2	CLIP
8	GM-1 HEADSTOCK	1	HEADSTOCK
9	903 25 FOR BEACON RECEIVER	2	RECEIVER
10	1/2 DIA INS. TUBE PILLARS	2	PILLARS
11	25A SCREWED ROD	2	ROD
12	1/2 SUPPLY POWER TRANSFORMER	1	TRANSFORMER
13			
14	11436 BS SOCKET	1	SOCKET
15	11436 AP PLUG	1	PLUG
16	MKT. PLUG T.S.	1	PLUG
17	ROUNDED	1	ROUNDED
18	FUSE HOLDER	1	FUSE HOLDER
19	FUSE HOLDER	1	FUSE HOLDER
20	PC/10	1	PC/10
21	MK/2	1	MK/2

TB2 (ITEM 13) RETIRED

RED. SCALE

43M ELECTRICAL CONTROLS LTD.

DRG. NO.

M1718

REVISIONS: PC 1619 ADDED, PAGES 10, 8, 8, 5

ADDED, TB4 ADDED - 12, 11, 8, 2

GENERAL ARRANGEMENT OF ORAC POWER SUPPLIES

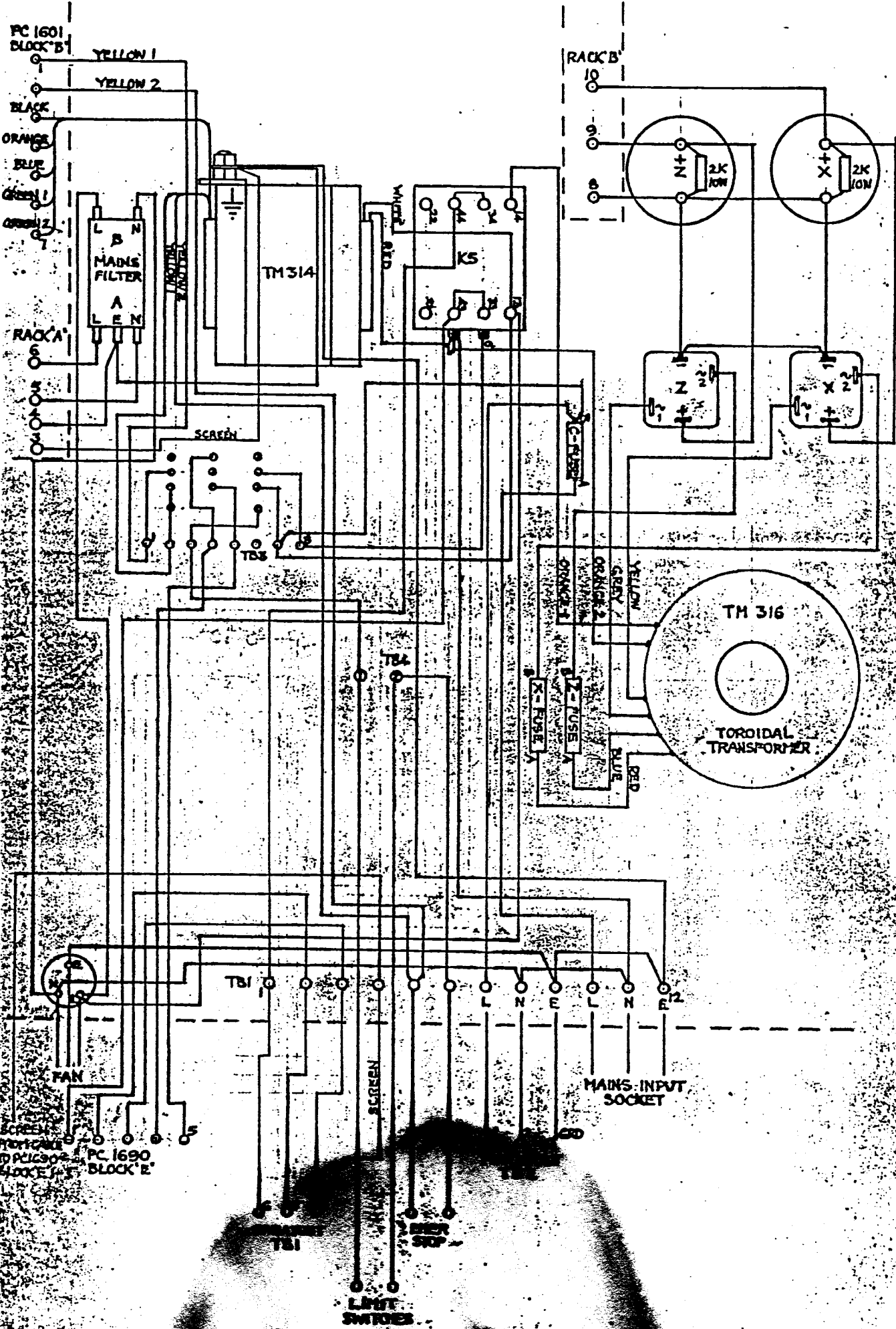
FOR DETAILS OF TRANSFORMER HOUSING PANEL, SEE ON RIGHT

FRONT VIEW OF TRANSFORMER FUSE & T.B. MOUNTING PANEL

DRG. NO.

M1718

WIRING DIAGRAM FOR ORAC POWER SUPPLY

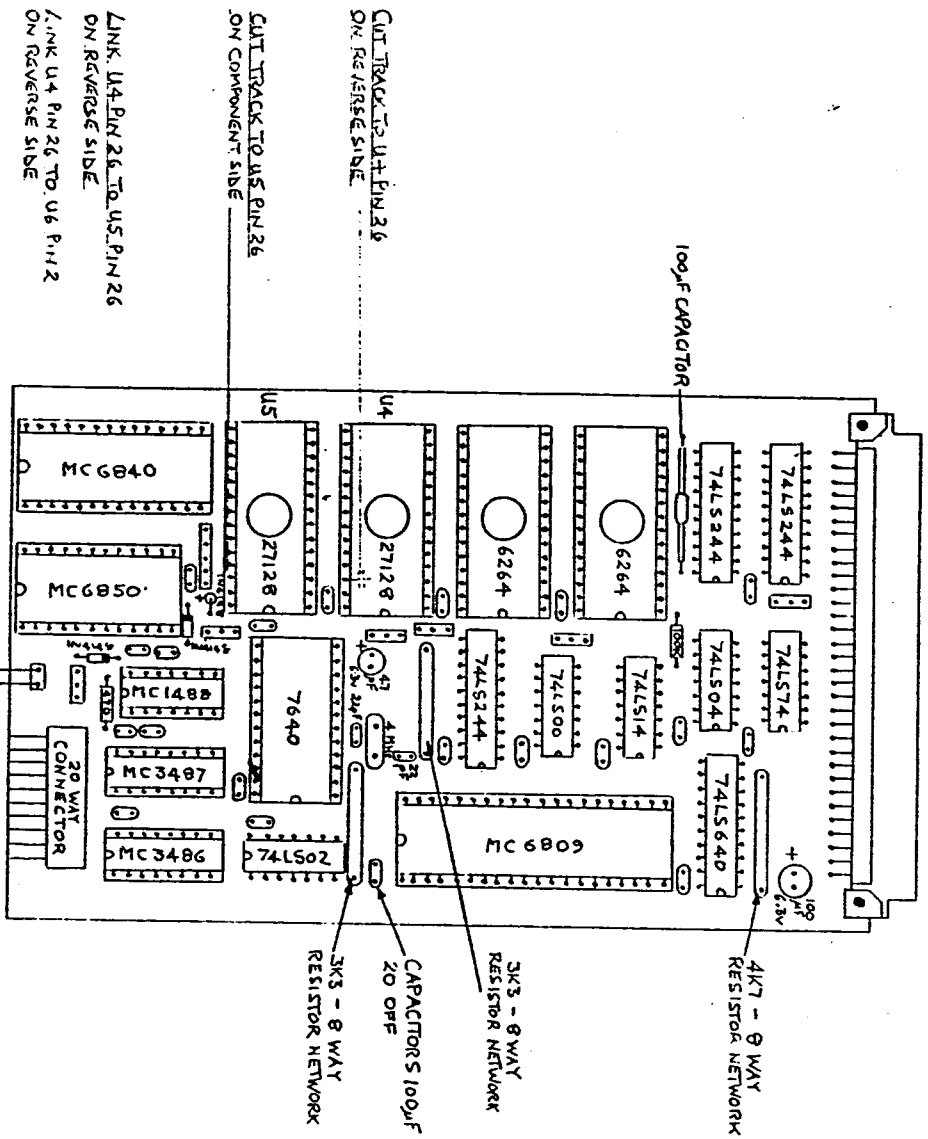


JOB	PC 1601
CODE	2/5
DWG	
REV	

SIN ELECTRICAL CONTROLS LTD.
 ACTON WORKS
 ACTON TOLL ROAD
 UXTON, MIDDLESBROUGH
 YORKS, HD1 1J

DWG. NO. M1721

SEE ORG. 5 FOR CIRCUIT DIAGRAM.

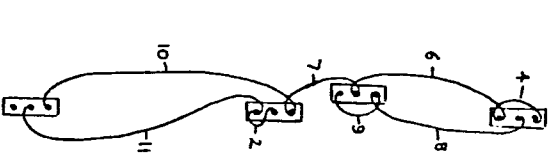


CUT TRACK TO U4 PIN 26
ON REVERSE SIDE

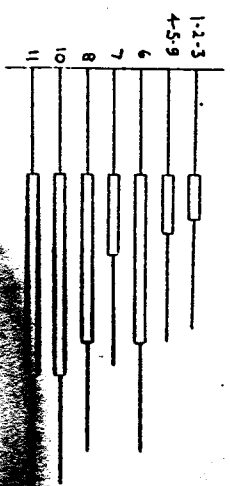
CUT TRACK TO U5 PIN 26
ON COMPONENT SIDE

LINK U4 PIN 26 TO U5 PIN 26
ON REVERSE SIDE

LINK U4 PIN 26 TO U6 PIN 2
ON REVERSE SIDE



DETAILS OF WIRE WRAP LINKS ON
PCB CONNECTION PINS



1.2.3. ALL ARE LINK
4.5.6.7.9.10 ARE RND

COMPONENT LAYOUT FOR MP09 CARD FOR DRAC MK III

JOB	CODE	DRN	CKD
		A C H	

GSH ELECTRICAL CONTROLS LTD.
VICTORIA WORKS,
QUEENS HILL ROAD,
HUDDERSFIELD,
W. YORKS. HD1 3JF

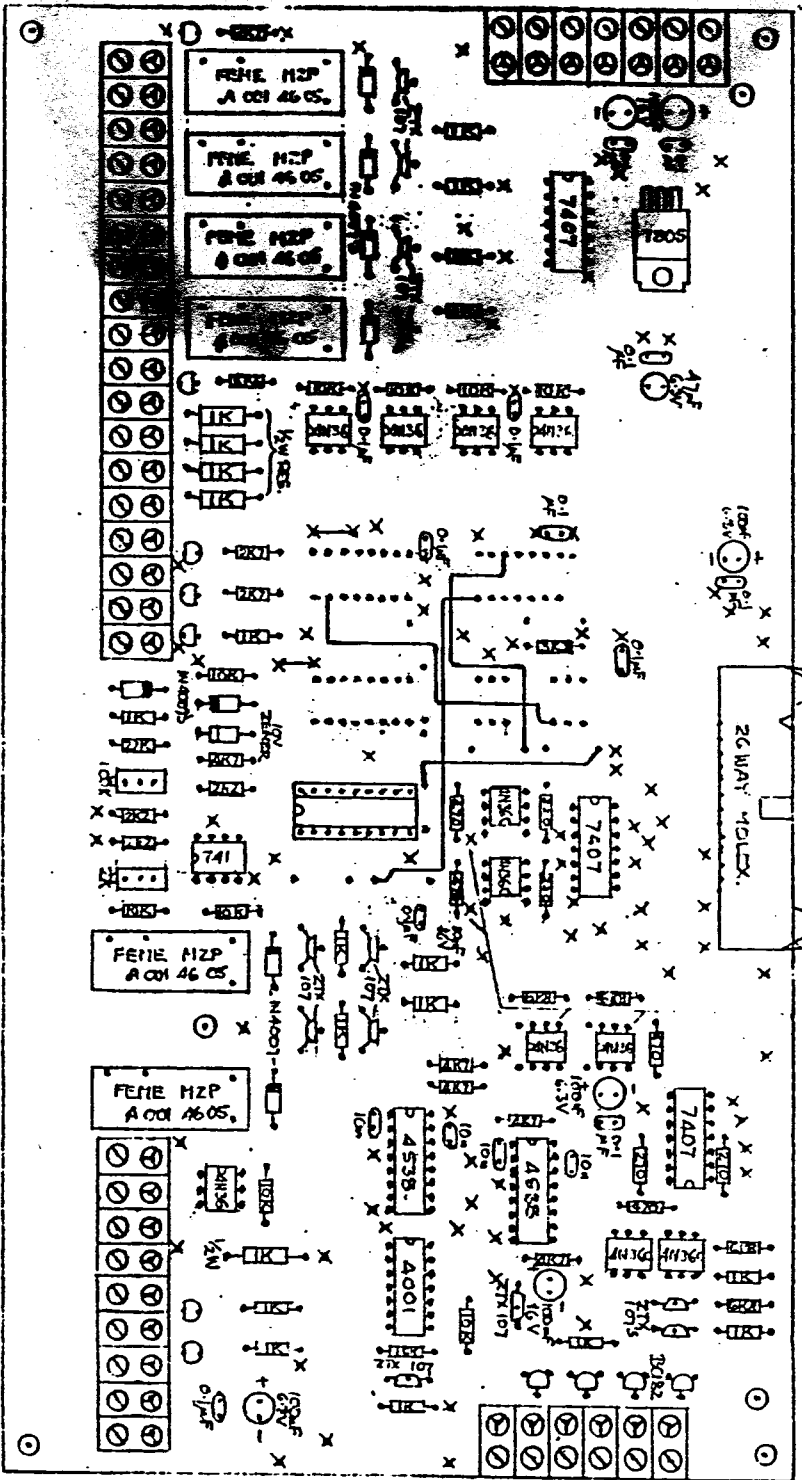
DRG. No. **M1768**

REVISIONS

TITLE

TYPE MR-25 RESISTOR-150K
0.22µF CAPACITOR - WITH 10%.
100V

A-61157'S CHANGED TO
4MSX OLD PINS 1 & 8 NOT
USED. PINS 6 ON 4MSX-N.C.



LINK WIRES TO BE FITTED AS SHOWN

1 2 3	COLOUR	CODE	VALUE
1	BR	BR	1K
2	Y	Y	10K
3	R	R	100K
4	BR	BR	1M
5	Y	Y	10M
6	R	R	100M
7	BR	BR	1G
8	Y	Y	10G
9	R	R	100G
10	BR	BR	1T
11	Y	Y	10T
12	R	R	100T
13	BR	BR	1P
14	Y	Y	10P
15	R	R	100P
16	BR	BR	1N
17	Y	Y	10N
18	R	R	100N
19	BR	BR	1µ
20	Y	Y	10µ
21	R	R	100µ
22	BR	BR	1m
23	Y	Y	10m
24	R	R	100m
25	BR	BR	1s
26	Y	Y	10s
27	R	R	100s
28	BR	BR	1d
29	Y	Y	10d
30	R	R	100d
31	BR	BR	1y
32	Y	Y	10y
33	R	R	100y
34	BR	BR	1c
35	Y	Y	10c
36	R	R	100c

THIS BOARD USED IN CONJUNCTION
WITH MODIFIED PC1623 - SEE M.1849

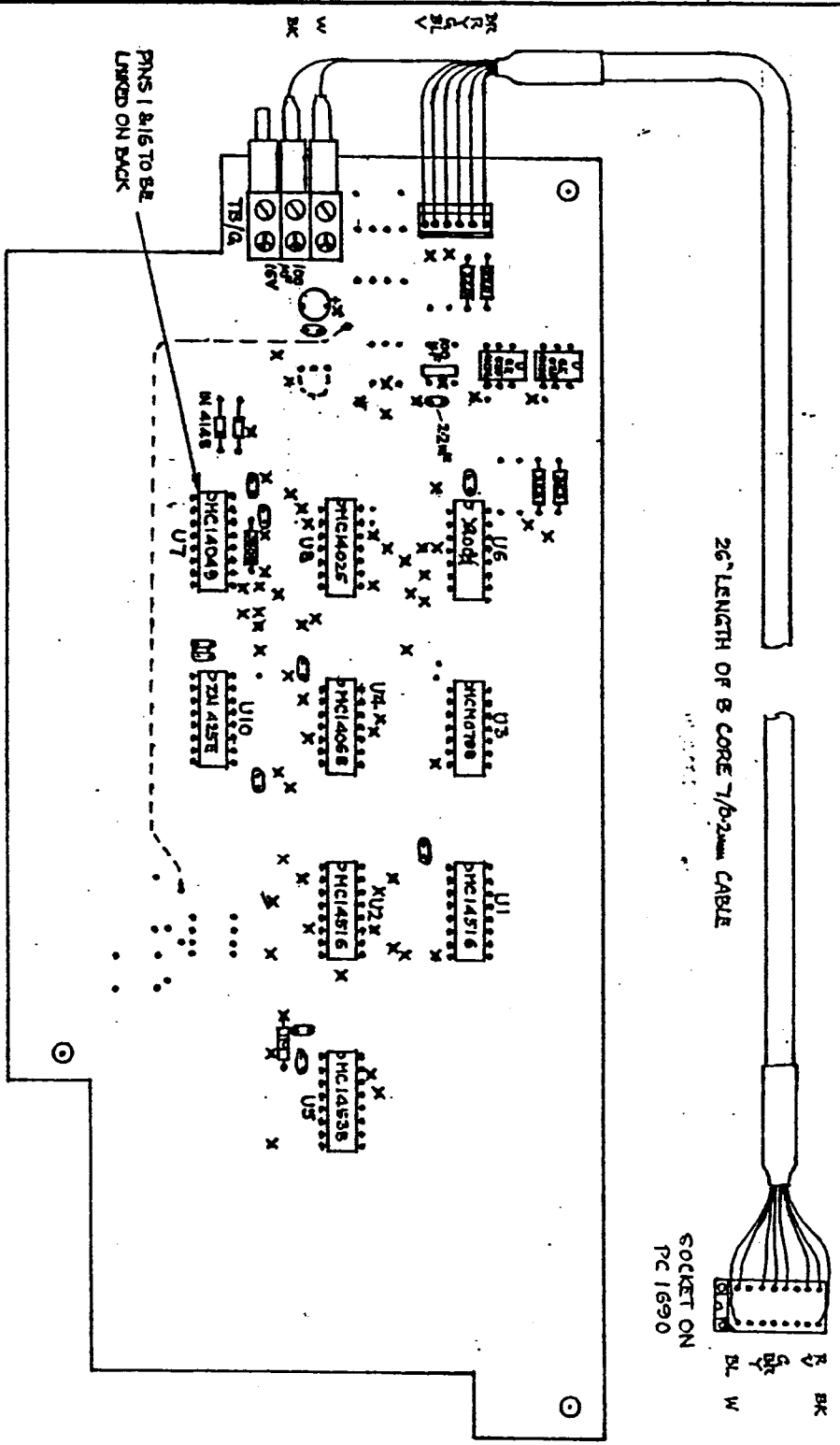
REVISIONS VARIOUS DELETIONS & ADAPTATIONS
TO BOARD. 30. 8. 83 & 3.2.84

COMPONENT LAYOUT FOR MODIFIED PC1690
SYNJECT HX1 COMPUTER INTERFACE BOARD

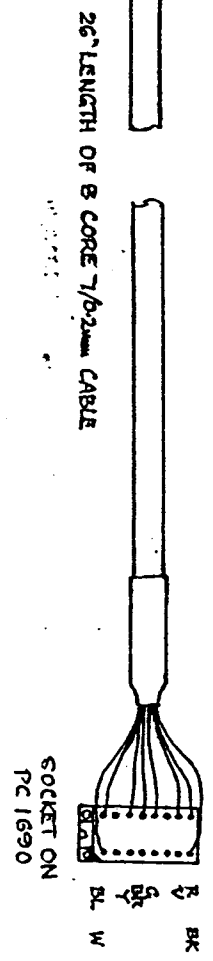
REV	CODE	DATE
1	DNM	7.83
2	CKD	

GSM-SYNTEL LTD. DRG. No.
VICTORIA WORKS
QUEEN'S HILL ROAD,
HUDDERSFIELD,
WEST YORKSHIRE WF1 1PP

M1848



- - 100µF CAPACITORS UNLESS MARKED OTHERWISE.
- ✕ - THROUGH BOARD CONNECTING PINS.
- ALL RESISTORS 1/4W, 5% TOLERANCE.
- BACK OF BOARD CABLE LINKS SHOWN DOTTED.

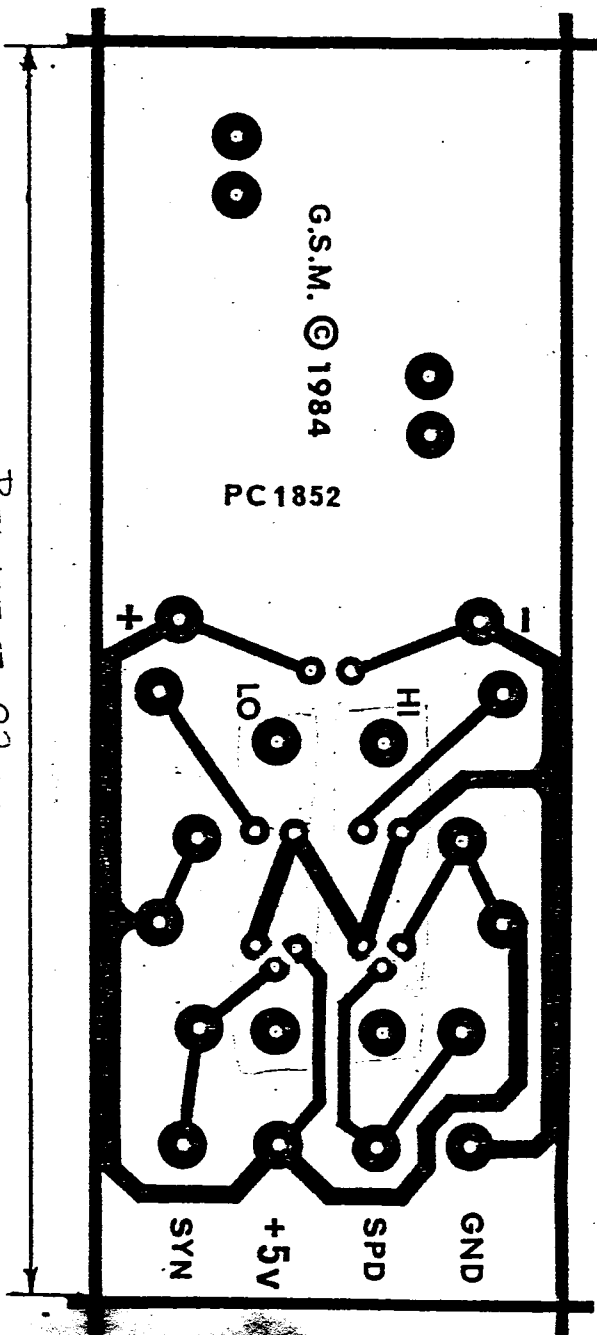


RESISTOR VALUE	RESISTOR VALUE	RESISTOR VALUE	RESISTOR VALUE	RESISTOR VALUE	RESISTOR VALUE
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K
10K	10K	10K	10K	10K	10K

THIS VERSION USED ONLY WITH
MODIFIED PC 1690 - SEE M. N. 100

REVISIONS		JOB CODE				DATE	
TITLE		DWN.				9. 2. 84	
COMPONENT LAYOUT FOR MODIFIED PC 1623 ORAC SPINBLE SPEED OVERRIDE BOARD.		D.C.D.				1983	
GSH ELECTRICAL CONTROLS LTD.				VICTORIA WORKS, QUEEN'S HILL ROAD, HIDDERSDALE, W. YORKS. HD1 3P PHONE 0484 35912		DRG. No.	
M1849				M		10	

NOTE! THIS SIDE IS THE TRACK SIDE



FOR DRILLING DETAILS SEE S1853.

MATERIAL: $\frac{3}{32}$ GLASS FIBRE BOARD.

SCALE: TWICE FULL-SIZE.

REVISIONS REBORN FROM PC1752 TO INCLUDE 2x1K-04M. FULL-UP RESISTORS & 100M² CAPACITORS.

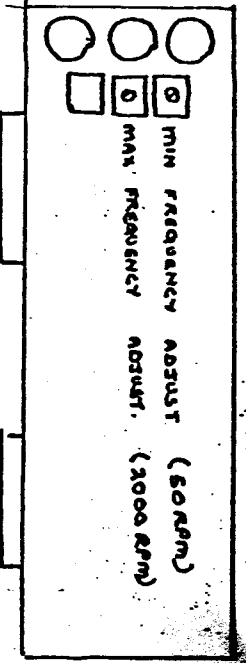
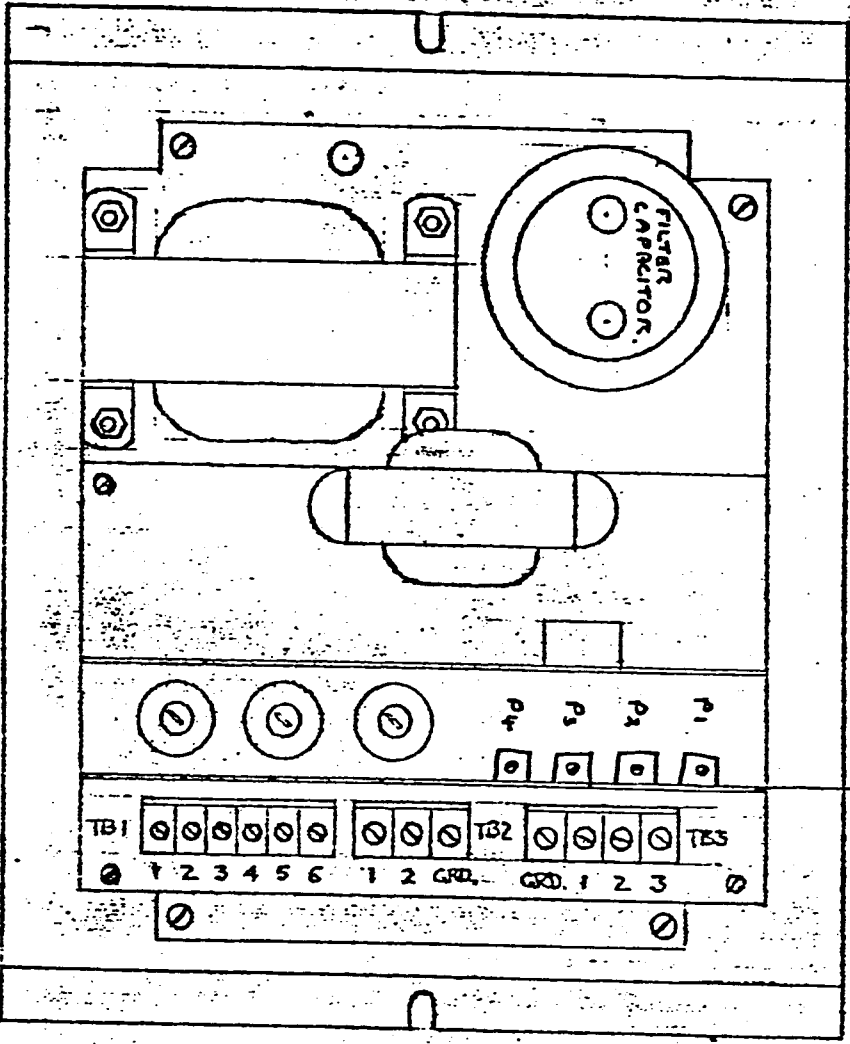
TITLE SYNTELECT MK III OPTO SENSOR P.C.B. (AXIAL MTS).

JOB	CODE	DRN.	CKD.	DATE
		PRB		20.2.84

GSM-SYNTEL LTD.
 VICTORIA WORKS,
 QUEENS MILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3PD
 Phone: 0484 38101/2

DRG. No.

PC1852



REVISIONS PARAJUST UNIT TURNED ON CHASSIS-10.9.83

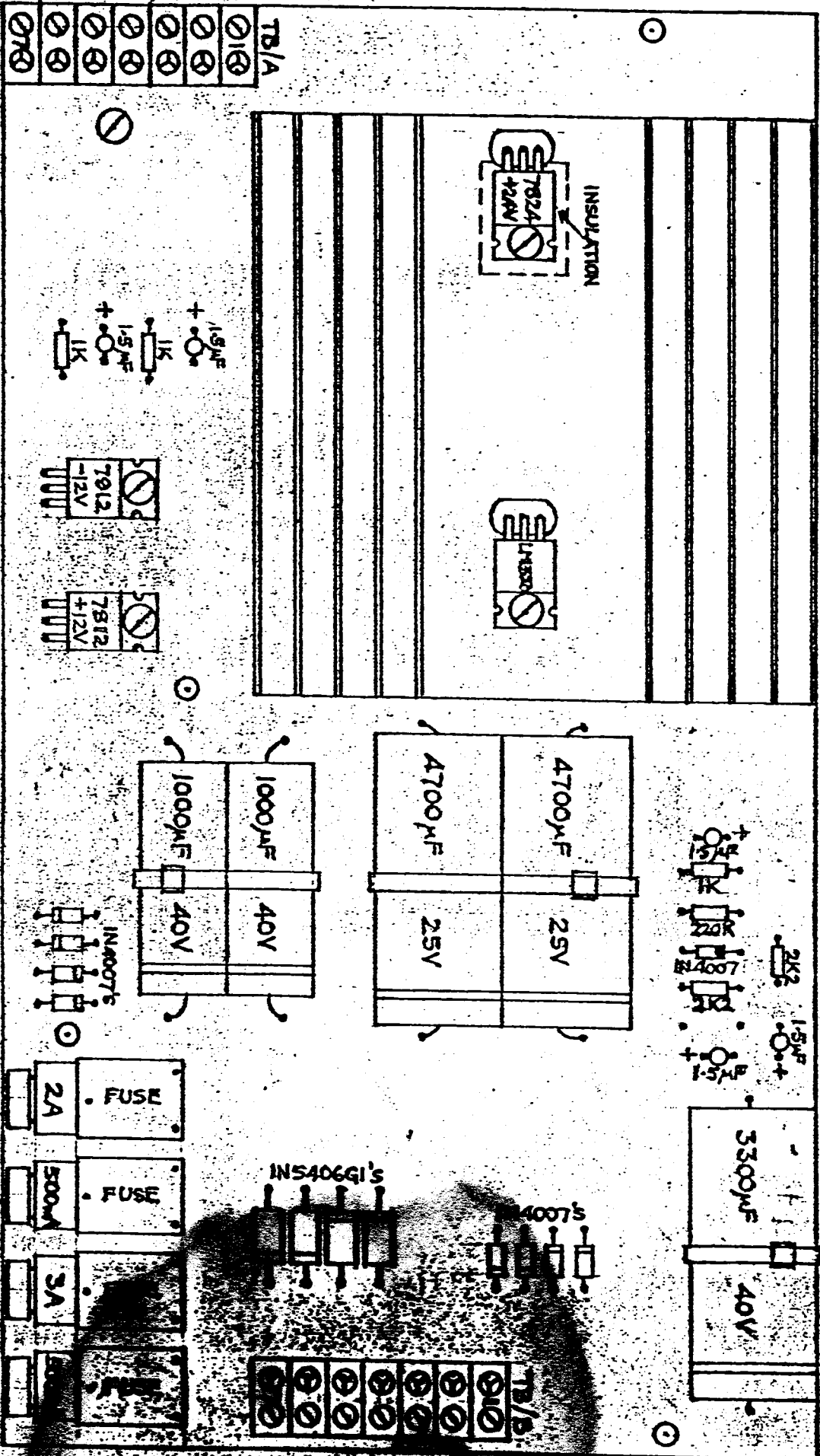
HALF SCALE

TITLE
GENERAL ARRANGEMENT OF FHP PARAJUST DRAC CHASSIS.

JOB CODE	
DAN. CKD.	JR
DATE	7.9.82

GSM ELECTRICAL CONTROLS LTD.
VICTORIA WORKS,
QUEENS MILL ROAD,
HUDDERSFIELD,
W. YORKS. HD1 3PJ
PHONE 0484 351012

DRG. No.
S 1609



REVISIONS 14V SUPPLY REMOVED
 22. 11. 82.

TITLE
 COMPONENT LAYOUT FOR PC 16011
 COMPUTER P.S.U. ON 'ORAC' MACHINE

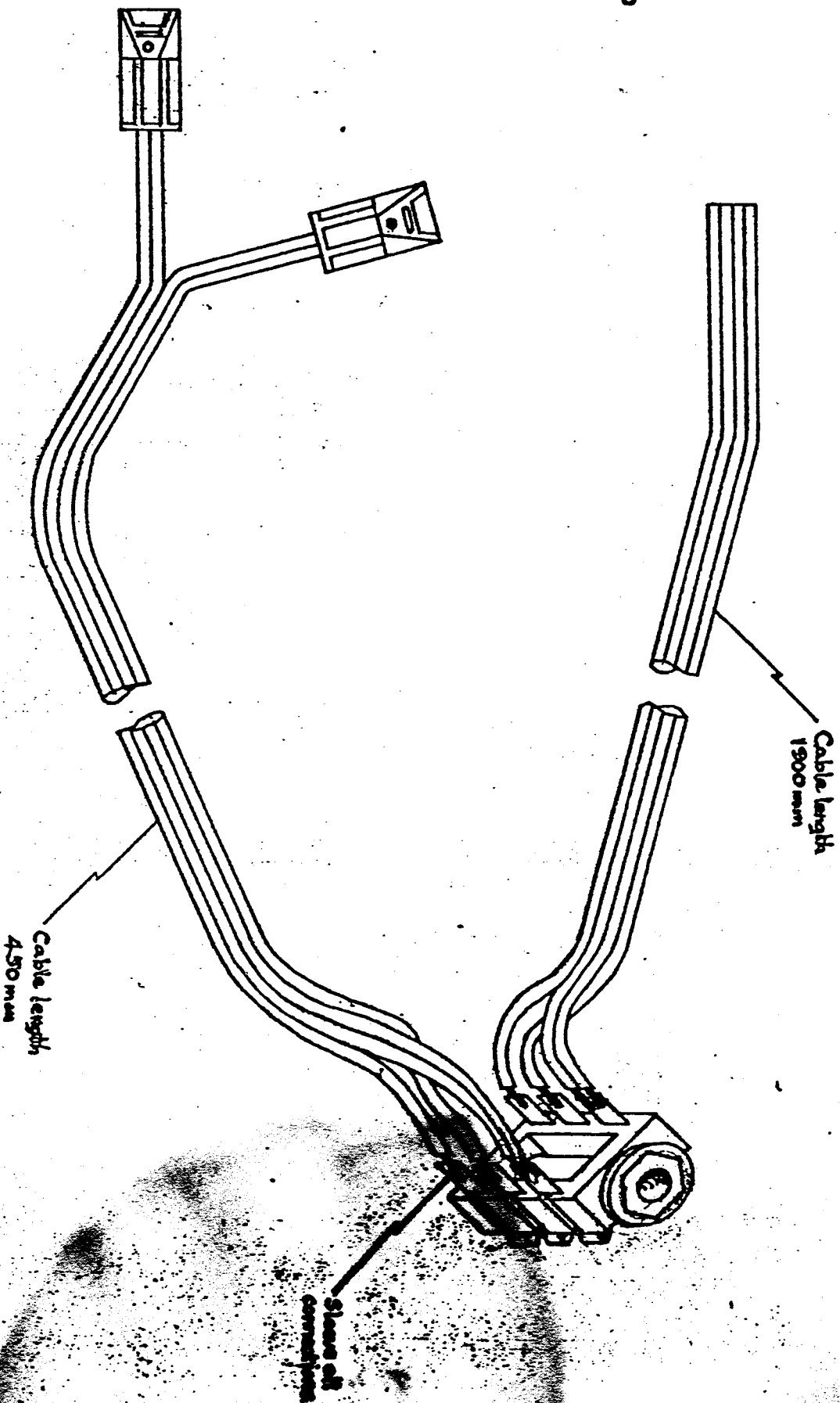
JOB	
CODE	
DRAWN	W.S.
CKD.	
DATE	7 9 82

GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS MILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3PJ
 PHONE 0484 381017

DRG. No.

S 1610

CABLE SUPPLIED
WITH SHARP
CASSETTE




REVISIONS

TITLE

JACK SOCKET CONNECTION DETAILS

JOB CODE	
DRN.	A. C. M.
CKD.	
DATE	18.11.82


GSM ELECTRICAL CONTROLS LTD.
VICTORIA WORKS,
QUEENS MILL ROAD,
HUDDERSFIELD,
W. YORKS. HD1 3PJ
PHONE 0484 35101/2

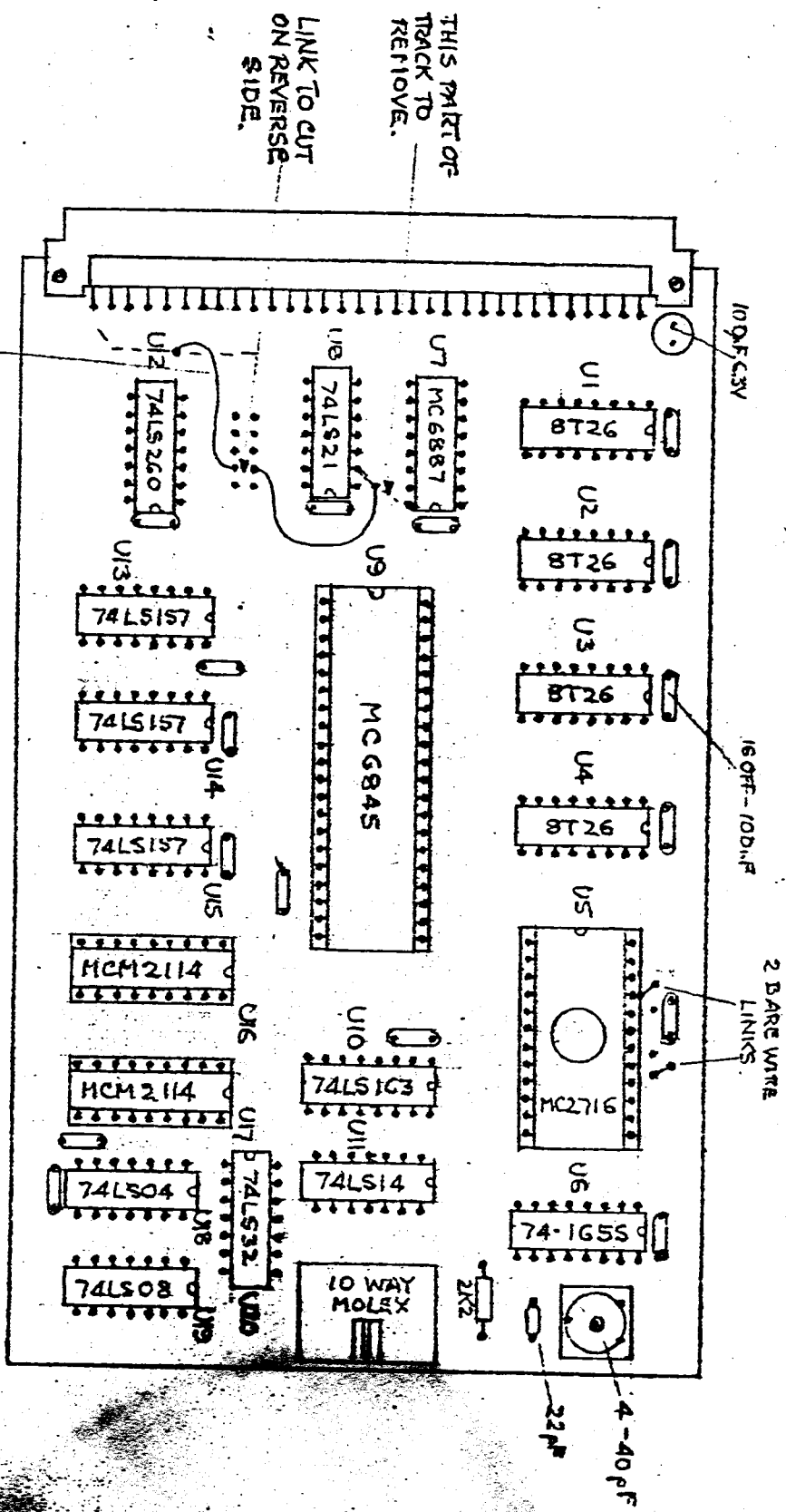
DRG. No.

S1632

REVISIONS

TITLE

COMPONENT LAYOUT FOR V1111 CARD.



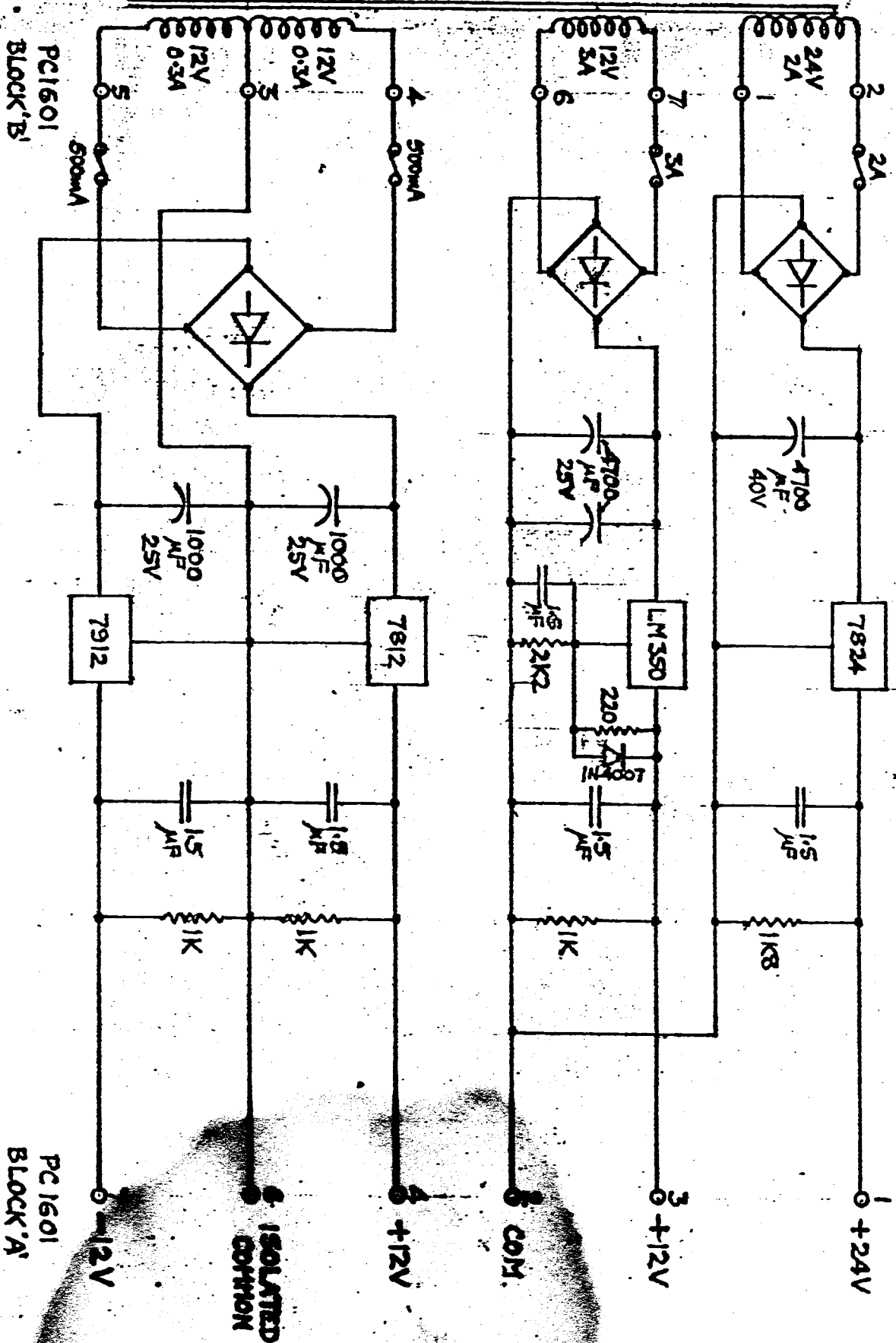
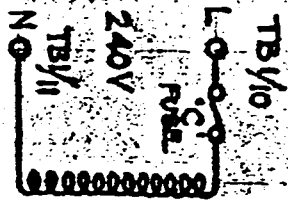
JOB	CODE
DRN.	PKS
CKD.	
DATE	G. 12.87



GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS MILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3PJ
 PHONE 0484 351012

DRG. No.

S1639



CIRCUIT DIAGRAM FOR PC 1601
 'ORAC' POWER SUPPLY REGULATOR BOARD

REVISIONS

TITLE

JOB	
CODE	
DRN.	S.P.S.
CKD.	
DATE	22. 12. 82



GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS HILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3JH
 PHONE 0484 35101/2

DRG. No.

S 1645

ORAC WOULD 181807

Symbol ECT HV 3 Connected 11/12/82

MR HUDDERSFIELD

11/12/82

REVISIONS

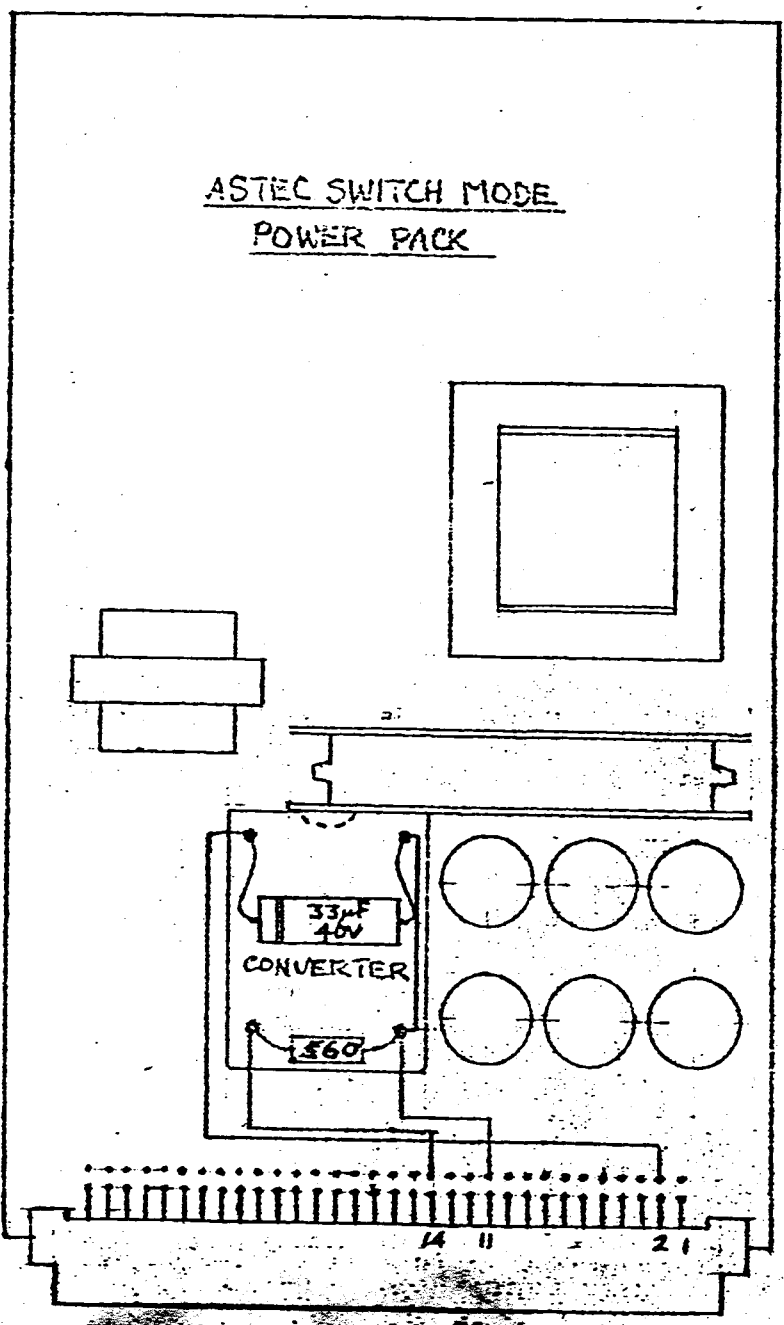
TITLE

DETAIL OF -12V CONVERTER MOUNTING & CONNECTIONS
TO ASTEC POWER PACK FOR 'ORAC' MACHINE.

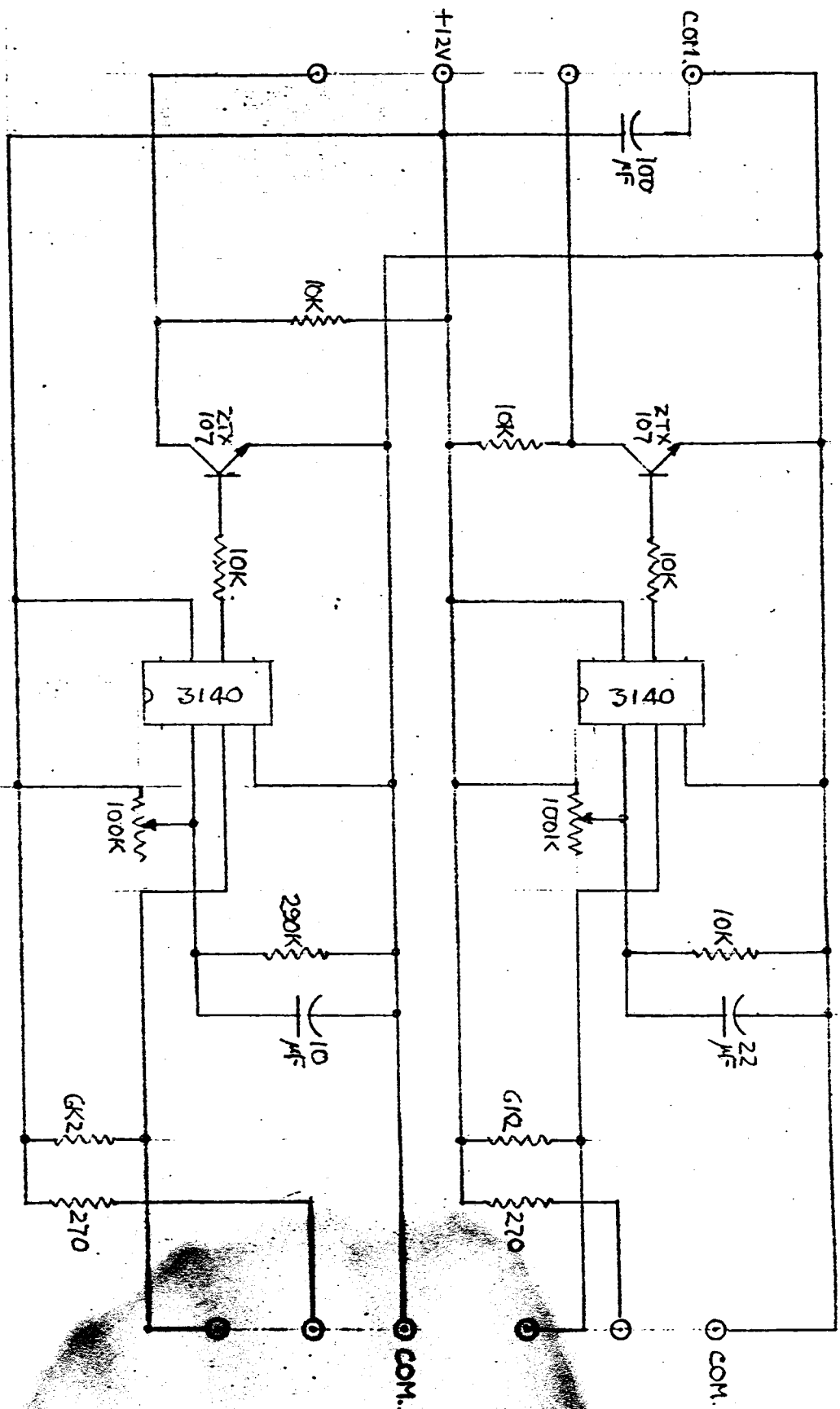
JOB	
CODE	
DRN.	113
CKD.	
DATE	10.1.84

GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS MILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3JF
 PHONE 0484 351012

DRG. No.
S 1649



**-12V TO -12V CONVERTER
 MOUNTED ON HEAT SINK
 WITH SUPERGLUE.**



REVISIONS

TITLE

CIRCUIT DIAGRAM FOR SENSOR-PC1607

JOB	CODE	DRN.	CKD.	DATE
		9.92.		14. 8. 82



GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS MILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3PJ
 PHONE 0484 35101/2

DRG. No.

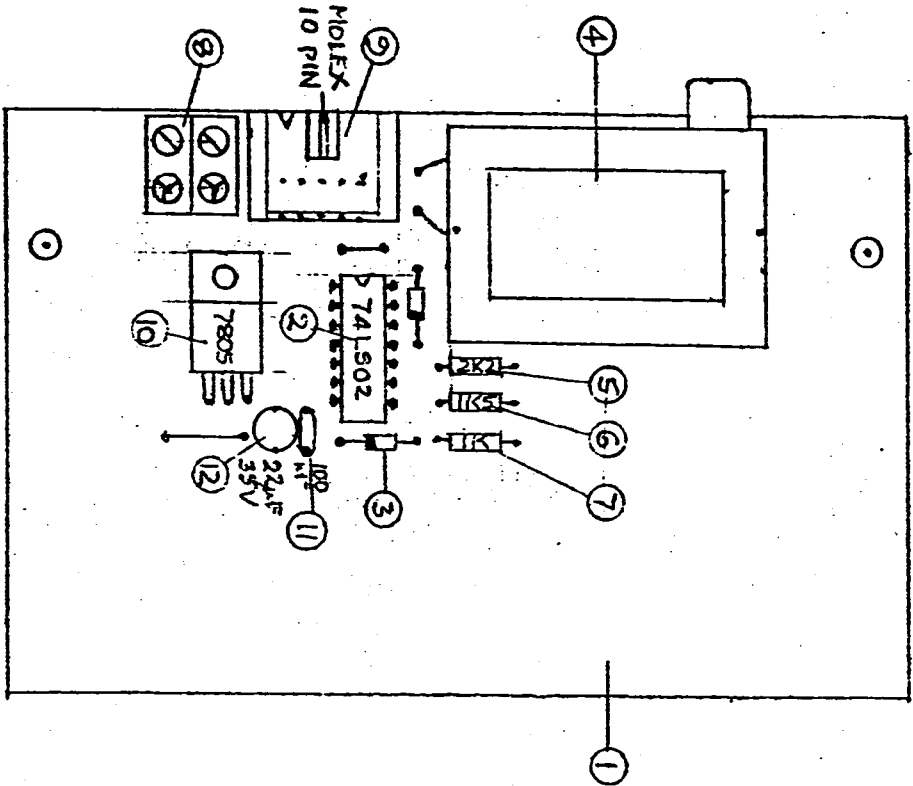
S 1666

KENTON WARD 315077

UNREPLICATED MATERIAL FOR REPRODUCTION IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF THE AUTHOR

CO.

HUDDERSFIELD, W. YORKS. HD1 3PJ



ITEM NR	DESCRIPTION	PART NR	QTY	REMARKS
1	P.C. BOARD.	PC1626	1	
2	N74LS02N.	91C46	1	
3	BAV1501 DIODE	SDD20	2	
4	UM1111E36 MODULATOR.	GH197	1	
5	2K2. 1/4W. RES.	XR222	1	
6	1K5. " "	XR152	1	
7	1K. " "	XR102	1	
8	3WAY TERM BLOCK	TS401	1	
9	10WAY RIBBON CABLE CONNECTOR	TS212	1	
10	7805 REGULATOR	91C26	1	
11	0.1µF CAPACITOR	C144	1	
12	22µF 35V "	C225	1	

REVISIONS

TITLE

COMPONENT LAYOUT OF
MODULATOR BOARD-PC1626

JOB CODE	
DRN.	938.
CKD.	
DATE	17. 3. 83



GSM ELECTRICAL CONTROLS LTD.
VICTORIA WORKS,
QUEENS MILL ROAD,
HUDDERSFIELD,
W. YORKS. HD1 3PJ
PHONE 0484 351012

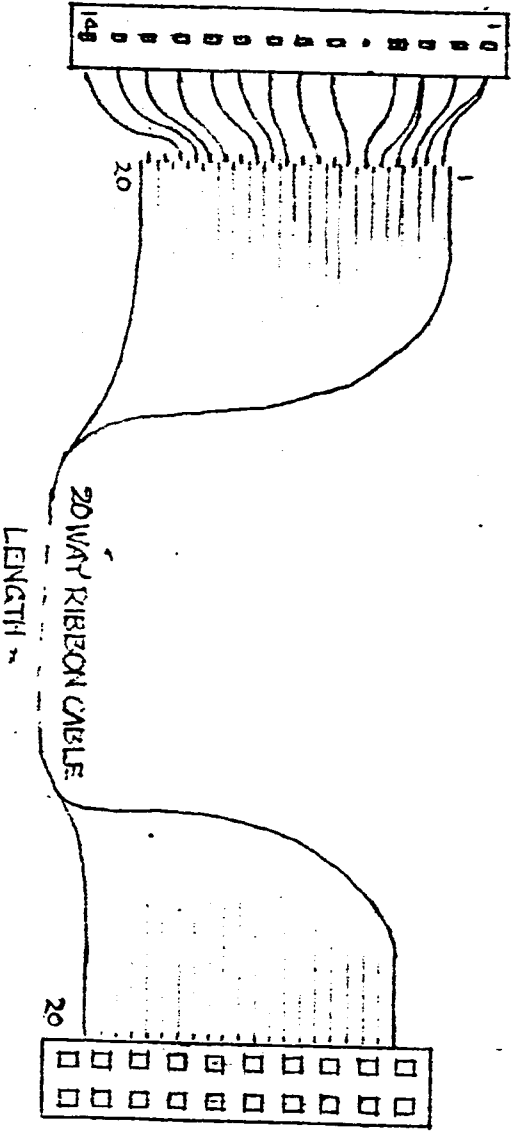
DWG. No.

S 1668

CABLE CONNECTIONS
 CASSETTE END
 CON. 8, 10, 14, 19 & 20 CUT-SHIFT

CABLE CONNECTIONS
 TIO'A' END
 NUMBER TO NUMBER

+12V	CABLE No. 1
CON. 8, 20	2
	3
	4 & 5
	6
KEYWAY.	7
VDA	9
BET	11
WCB	12
REV	13
FWD	15
RDC	16
RDA	17
CTP	18
WEN	



14 WAY IN-LINE PLUGS
 PIN 5 OMITTED.

20 WAY NOUX
 SOCKET

REVISIONS

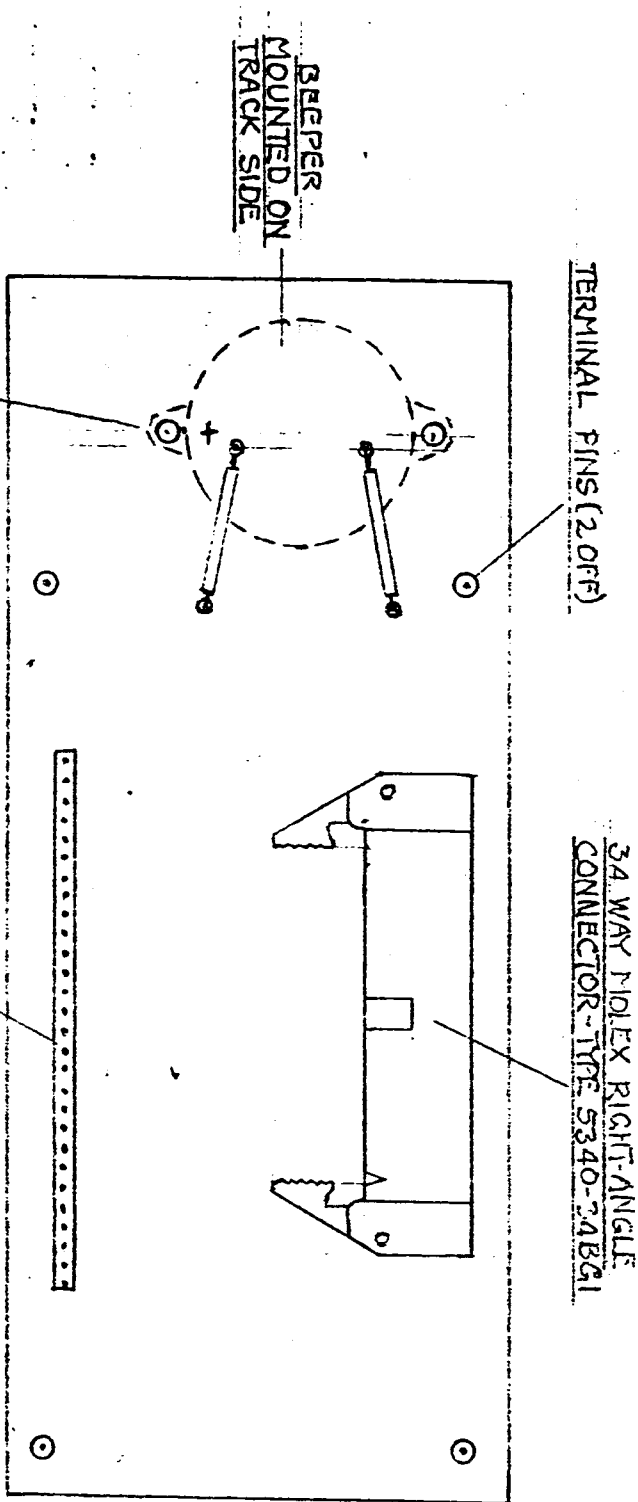
TITLE
 DATA CASSETTE RIBBON CABLE TO TIO'A' MODULE
 CONNECTION DETAILS

JOB	
CODE	
DRN.	J.S.
CKD.	
DATE	21. 4. 83

GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS HILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3P
 PHONE 0484 351072

DRG. No.
S1682

MK 3



TERMINAL PINS (2 OFF)

34 WAY MOLEX RIGHT-ANGLE CONNECTOR - TYPE 5340-2ABG1

BLEEPER MOUNTED ON TRACK SIDE

8BA FIXING SETSCREWS AND NUTS

28 WAY MOLEX SINGLE ROW CONNECTOR - TYPE 4030-28AAG

REVISIONS

TITLE
 COMPONENT LAYOUT FOR PC1692 - SYNTHELECT MKII
 KEYBOARD CONNECTOR & BLEEPER

JOB	
CODE	
DRN.	JTB
CKD.	
DATE	4. 7. 82

GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS MILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3PJ
 PHONE 0484 35101/2

DRG. No.
S 1698

REVISIONS

TITLE

CIRCUIT DIAGRAM OF ORAC POWER SUPPLY

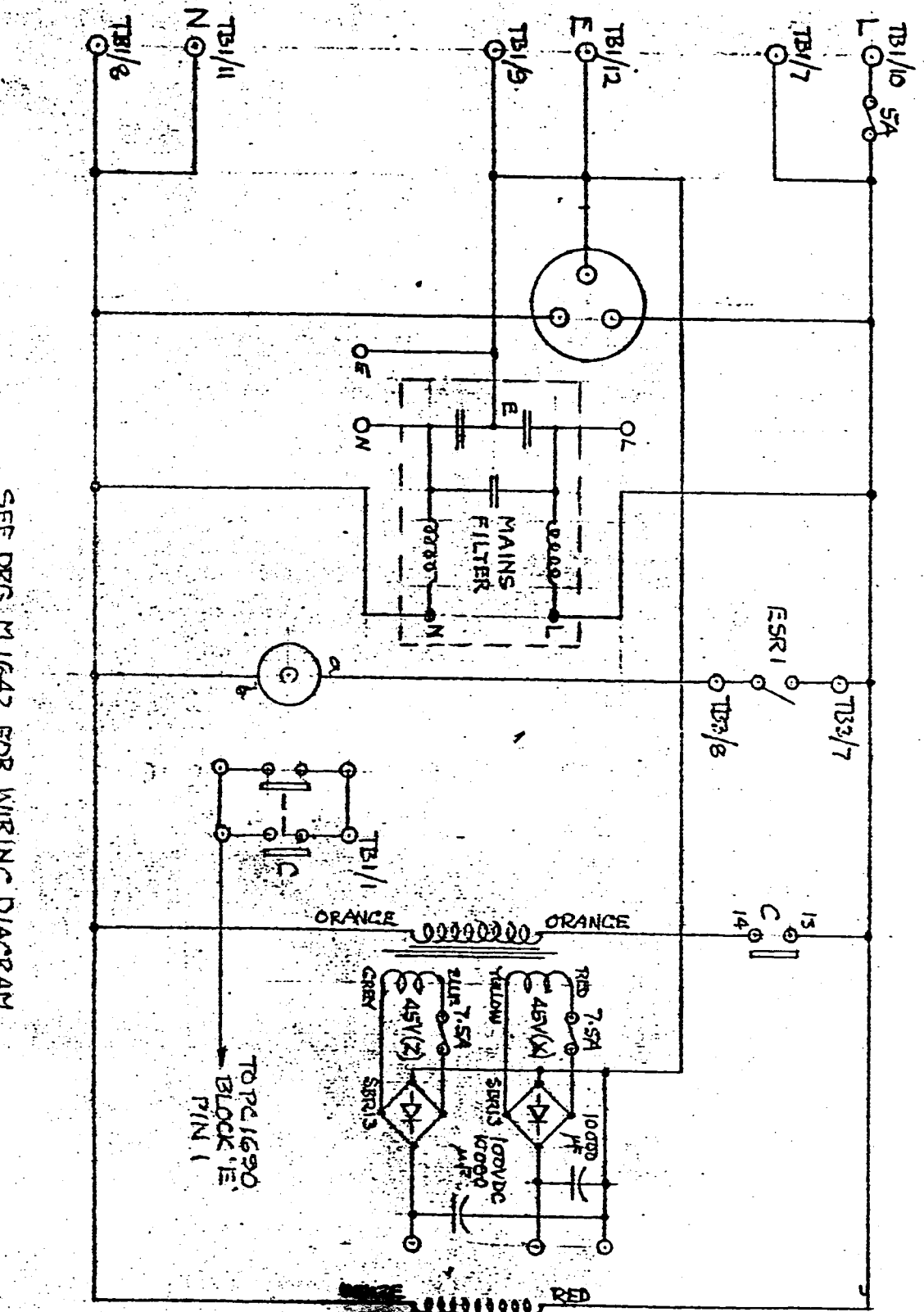
JOB	
CODE	
DRN.	J. G. S.
CKD.	
DATE	24 11 83

GSM ELECTRICAL CONTROLS LTD.
 VICTORIA WORKS,
 QUEENS MILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HD1 3M
 PHONE 0484 351017

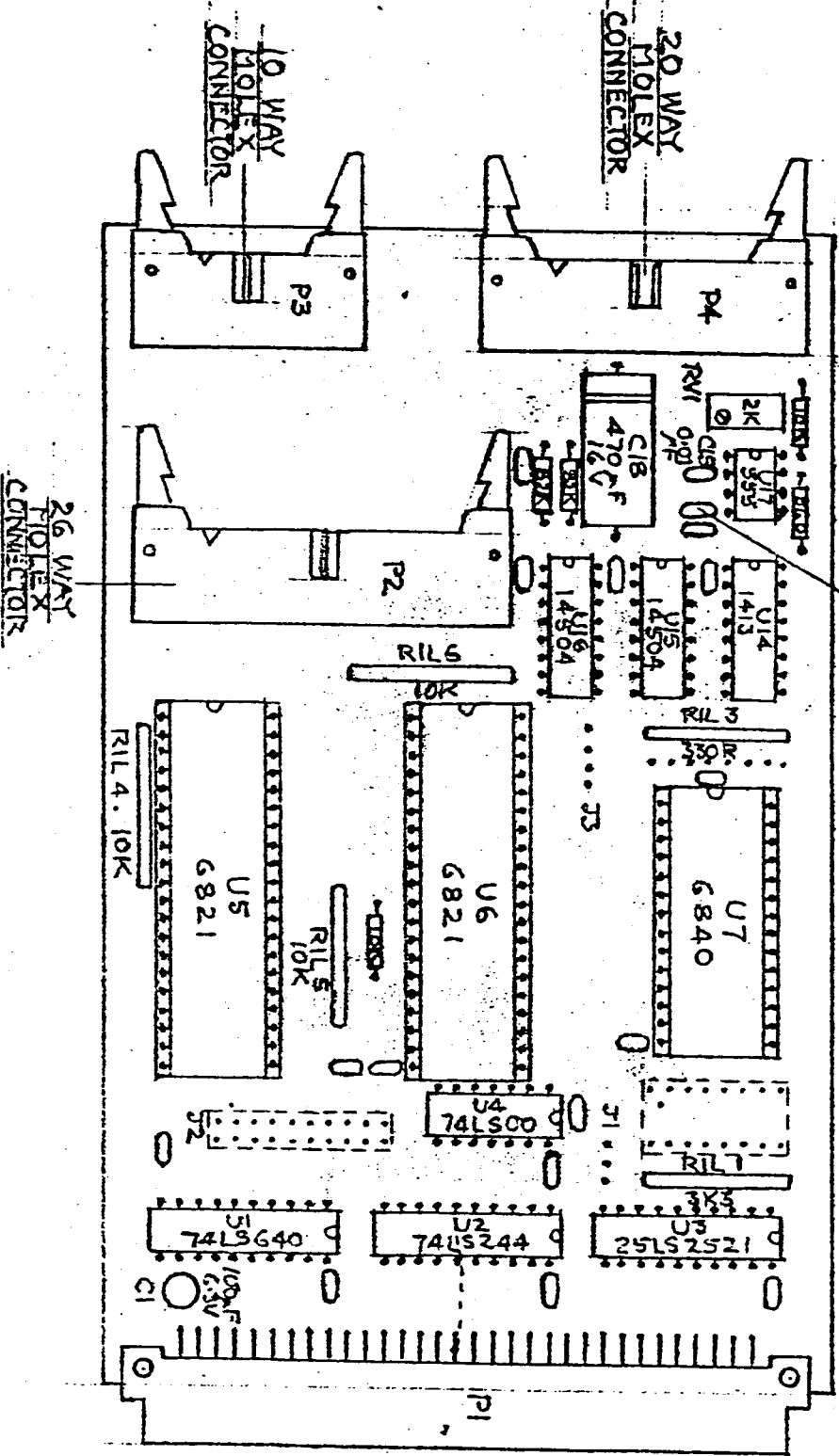
DRG. No.

S1719

SEE DRG. M1642 FOR WIRING DIAGRAM.



SMALL CAPACITORS
0.1µF. EXCEPT C15.



REVISIONS

TITLE
COMPONENT LAYOUT FOR
T10-A TIMER MODULE.

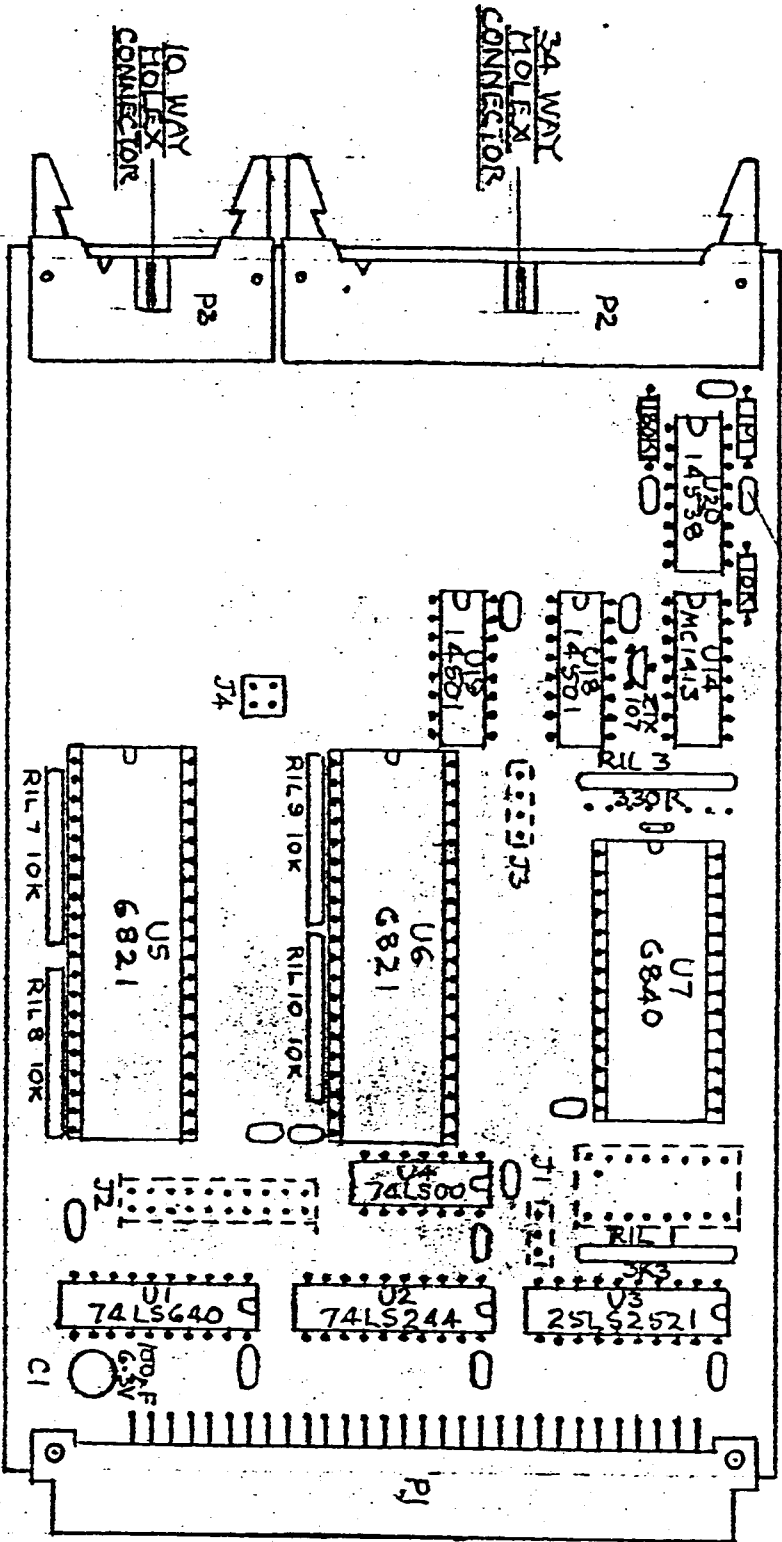
JOB	CODE	DRN.	CKD.	DATE
		J.R.		30.8.87

GSM ELECTRICAL CONTROLS LTD.
VICTORIA WORKS,
QUEENS MILL ROAD,
HUDDERSFIELD.
W. YORKS. HD1 3P
PHONE 0484 351012

DRG. No.
S1737

40K 21.5M ITC. 12.
MAY 1987

ALL SMALL CAPACITORS 0.1µF



REVISIONS

TITLE

COMPONENT LAYOUT FOR
TIO-B TIMER MODULE

JOB

CODE

DNN. 8/83

CKD.

DATE 30. 8. 83

GSM ELECTRICAL CONTROLS LTD.

VICTORIA WORKS,
QUEENS MILL ROAD,
HUDDERSFIELD,
W. YORKS. HD1 3PJ

PHONE 0484 351012

DRG. No.

S1738

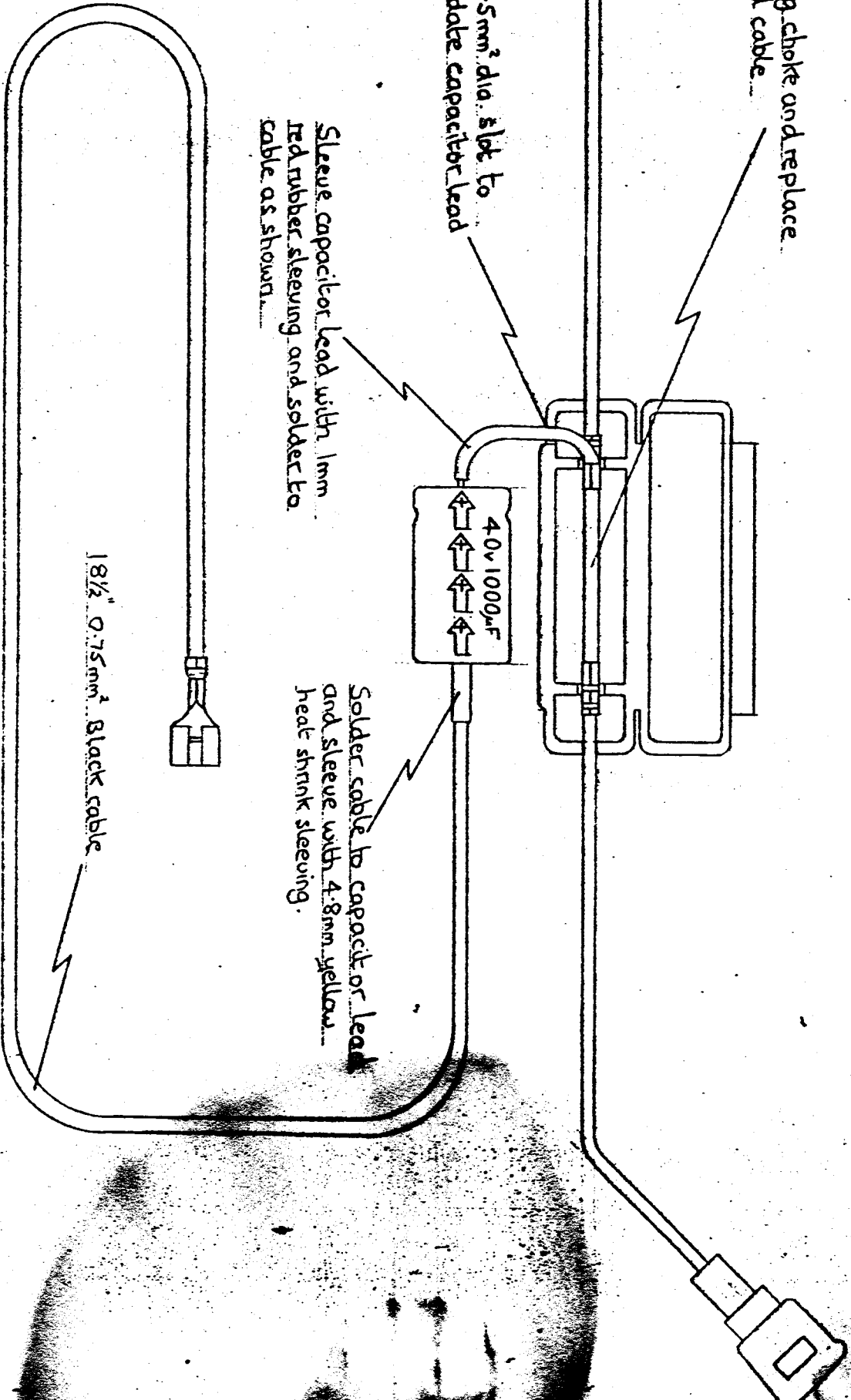
Remove existing choke and replace with 0.75mm² red cable

Melt a 2.5mm² dia. slot to accommodate capacitor lead

Sleeve capacitor lead with 1mm red rubber sleeving and solder to cable as shown

Solder cable to capacitor lead and sleeve with 4.8mm yellow heat shrink sleeving

1 1/2" 0.75mm² Black cable



REVISIONS

TITLE

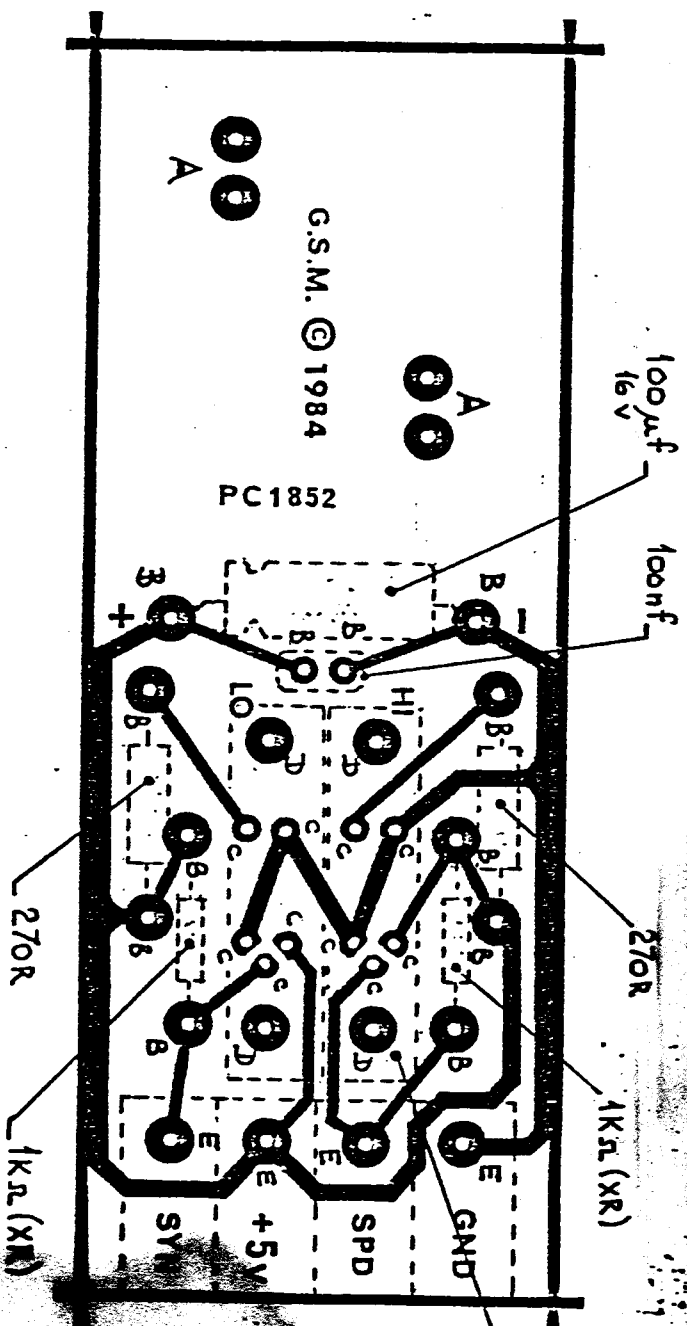
ALIGNING CASSETTE SLIPPIY CARTR

JOB	CODE
	DRN. A.C.H
	CKD.

GSM ELECTRICAL CONTROLS LTD.
VICTORIA WORKS,
QUEENS MILL ROAD,
HUDDERSFIELD,
W. YORKS. LYNN 3M

DRG. No. S1741

HOLE REF.	N° OFF	DRILLING DETAILS.
A	2	DRILL 2xN°26 THEN SLOT.
B	12	DRILL N° 60
C	10	PILOT N°70 THEN N° 60
D	4	DRILL N° 30
E	4	DRILL N° 54



FIXING DETAILS

1. "High" OPTO:- 2. OFF M3 x 12mm C.H. SCREWS WITH 4 BA NUTS AS SPACERS. SECURED WITH PLASTIC NUTS.
2. "Low" OPTO:- 2. OFF M3 x 10mm C.H. SCREWS & PLASTIC NUTS.
3. P.C.B. FIT TO BRACKET WITH 2 OFF 4 BA SCREWS AND SHAKEPROOF WASHERS.

REVISIONS

REBRAND FROM S1754 - EXTRA COMPONENTS FITTED.

TITLE DRILLING DETAILS ETC FOR P.C.1852 MK III OPTO-SENSOR
 P.C.B. FOR SYNTELECT.

JOB	CODE	DRN.	CKD.	DATE
		P.R.A.		21.2.84

GSM-SYNTEL LTD.
 VICTORIA WORKS,
 QUEENS MILL ROAD,
 HUDDERSFIELD,
 W. YORKS. HO1 3PD
 Phone: 0484 38101/2

DRG. No.

S1853