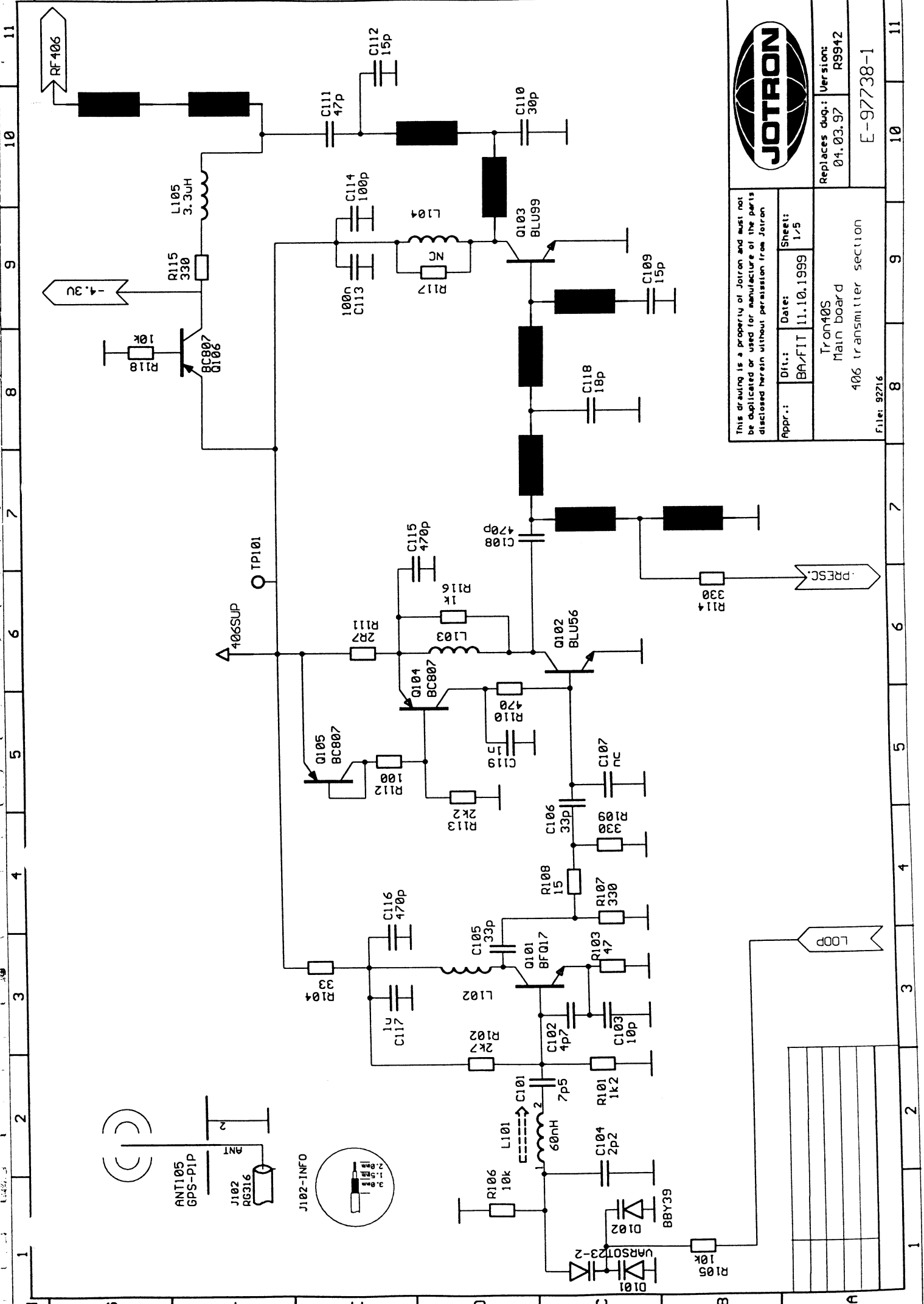
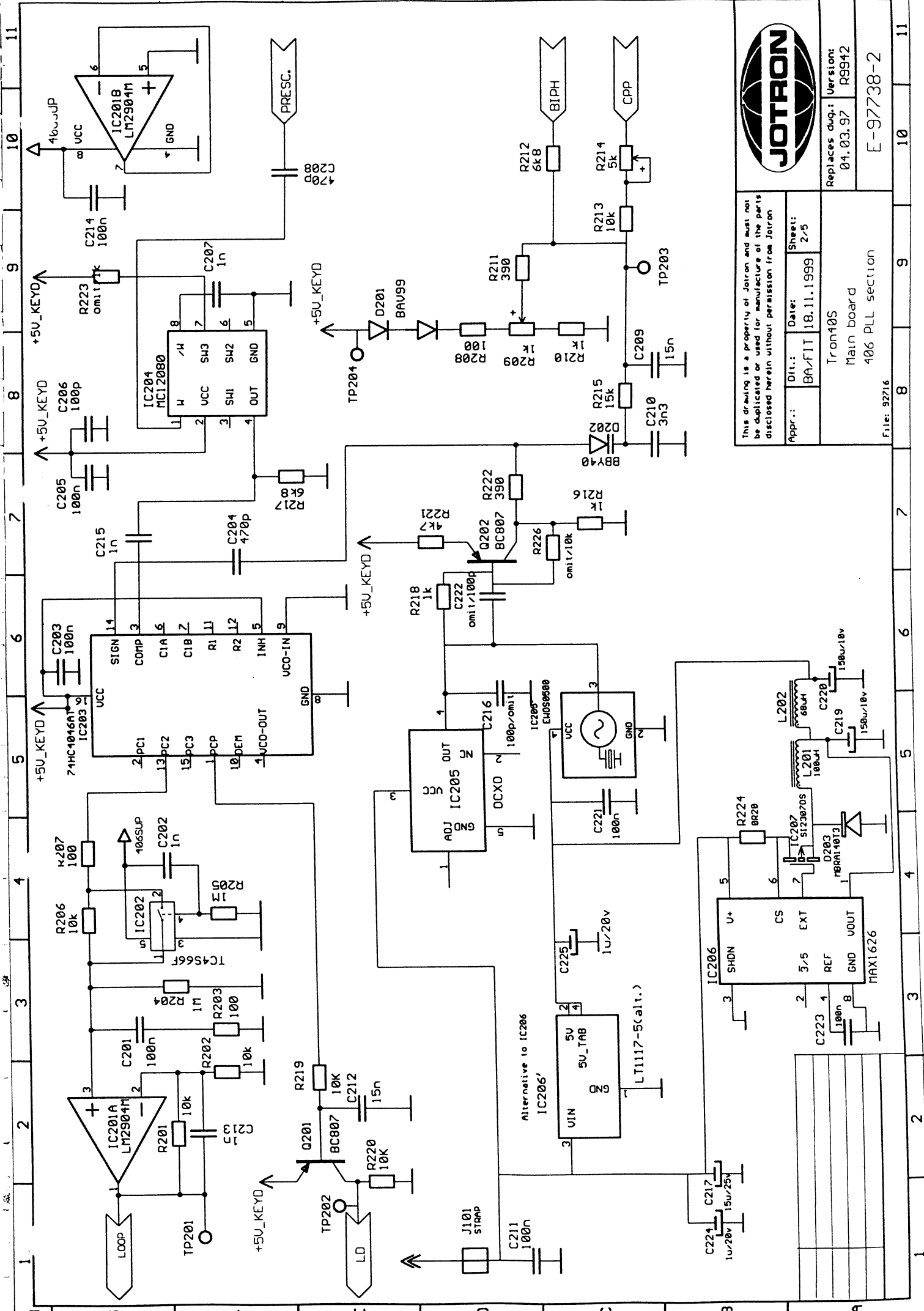




This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron

Appr.: BA/FIT Date: 11.10.1999 Sheet: 1/5

Replaces dng.: Version: 04.03.97 R9942	
Tron40S Main board	
406 transmitter section	
File: 92716	



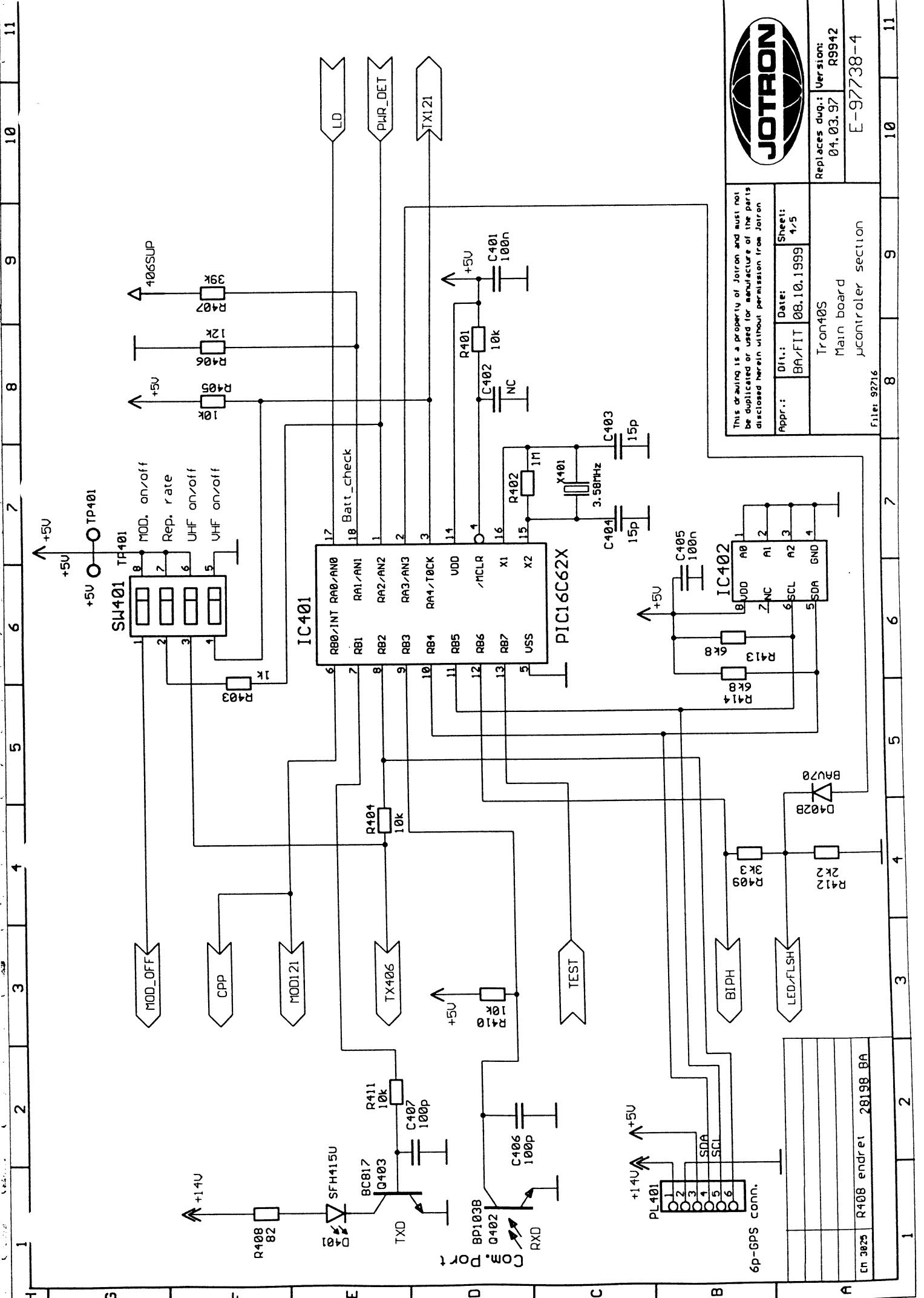
This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron

Appr.:	Dft.:	Date:	Sheet:
	BA/FIT	18.11.1999	2/5

Replaces duq.: 04.03.97	Version: R9942
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E-97738-2

File: 92716

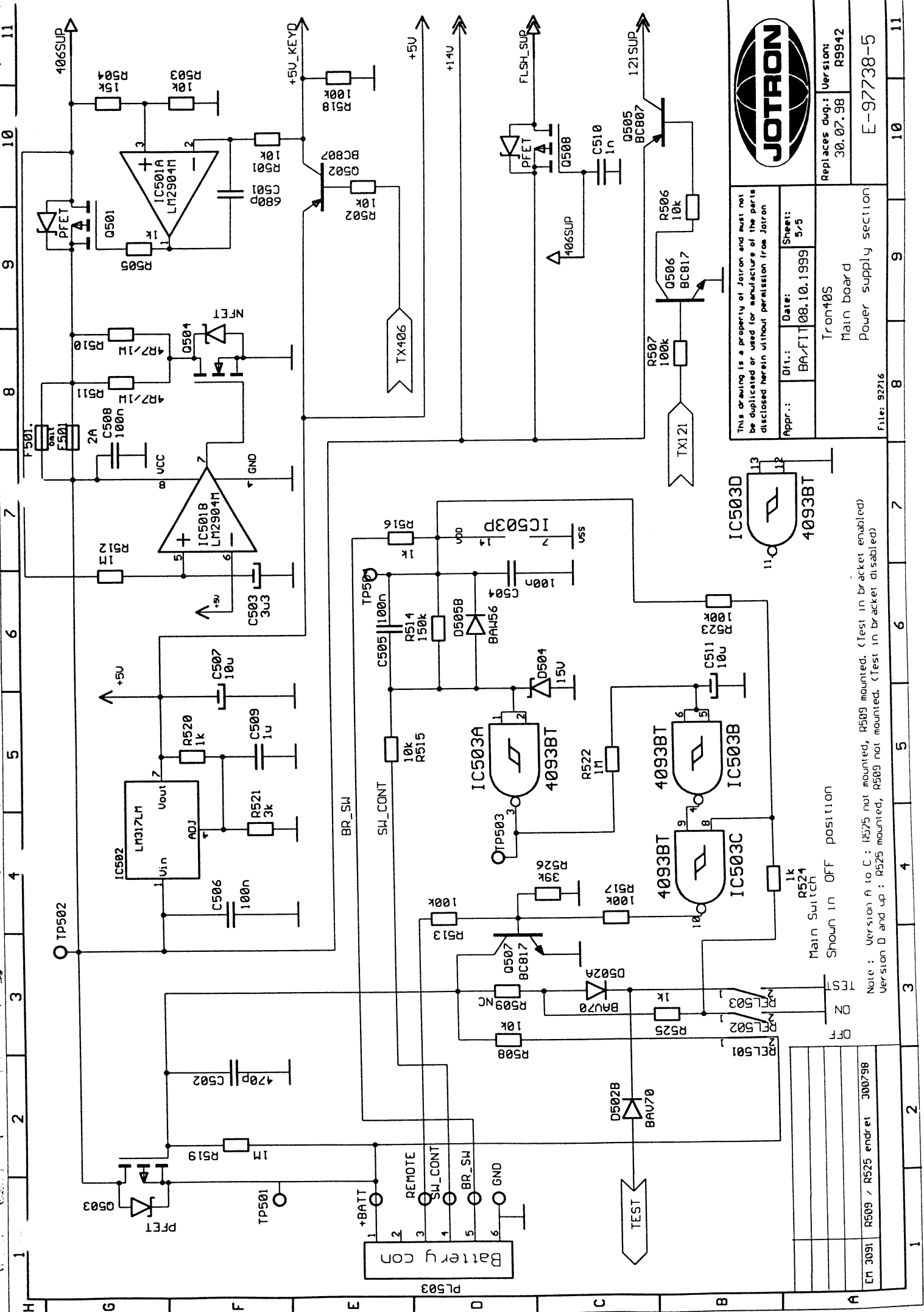


This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron



Appr.:	Dft.:	Date:	Sheet:
	BA/FIT	08.10.1999	1/5
Tron40S Main board µcontroller section			
Replaces dng.: Version: 04.03.97 R9942			
E-97738-4			

File: 92716



This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron

Appr.: BA/FIT Date: 08.10.1999 Sheet: 5/5

Tron40S Main board Power supply section

Replaces dsg.: Version: 30.07.98 R9942

E-97738-5

File: 92716

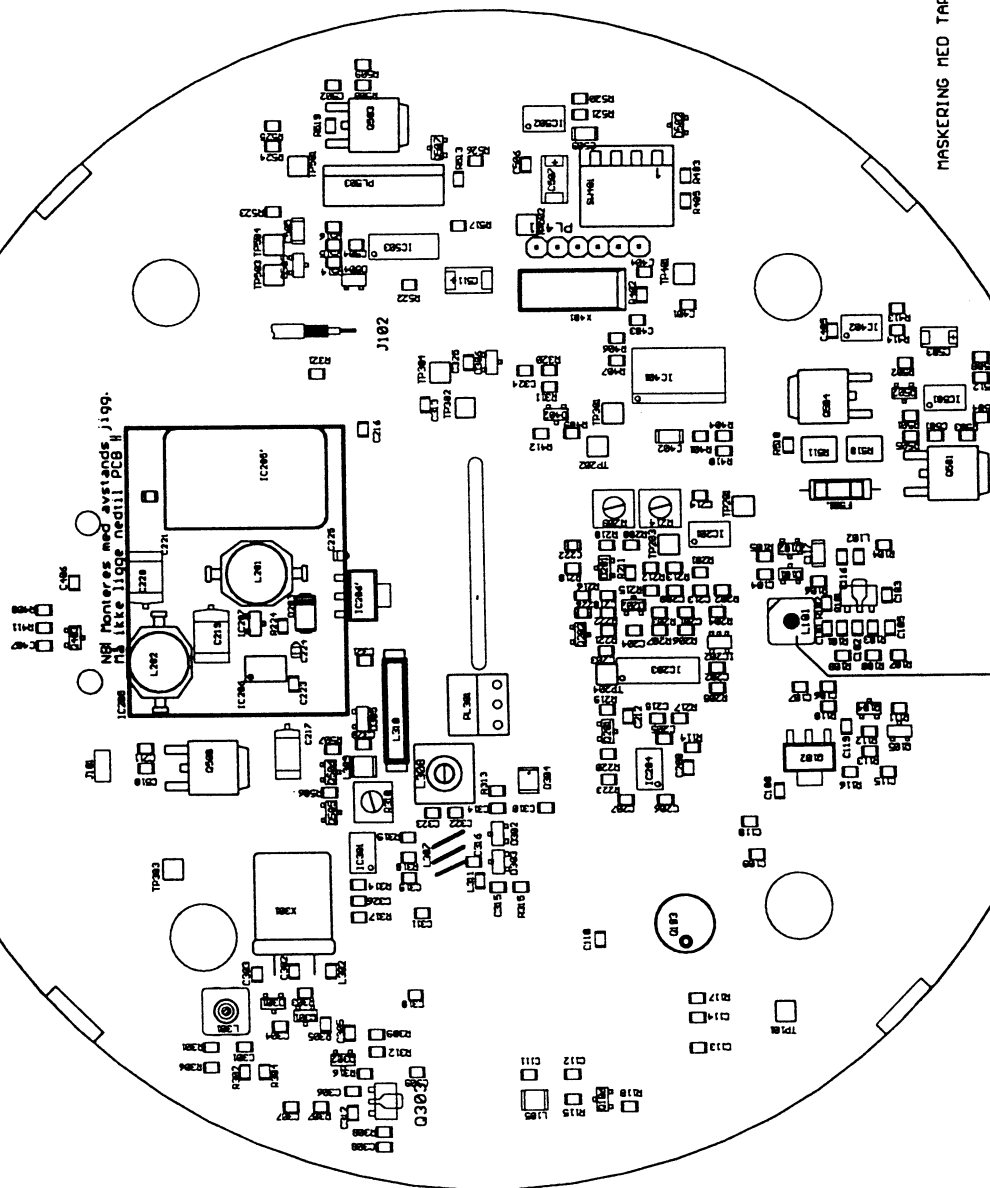
IC503D
4093BT

Main Switch
Shown in OFF position

Note : Version A to C : (R525 not mounted, R509 mounted, (Test in bracket enabled)
Version D and up : R525 mounted, R509 not mounted, (Test in bracket disabled)

ET 3091 R509 / R525 endret 300798

MAL IS FOR S.NR. PLASSERING
BARE MED EN TAPE.

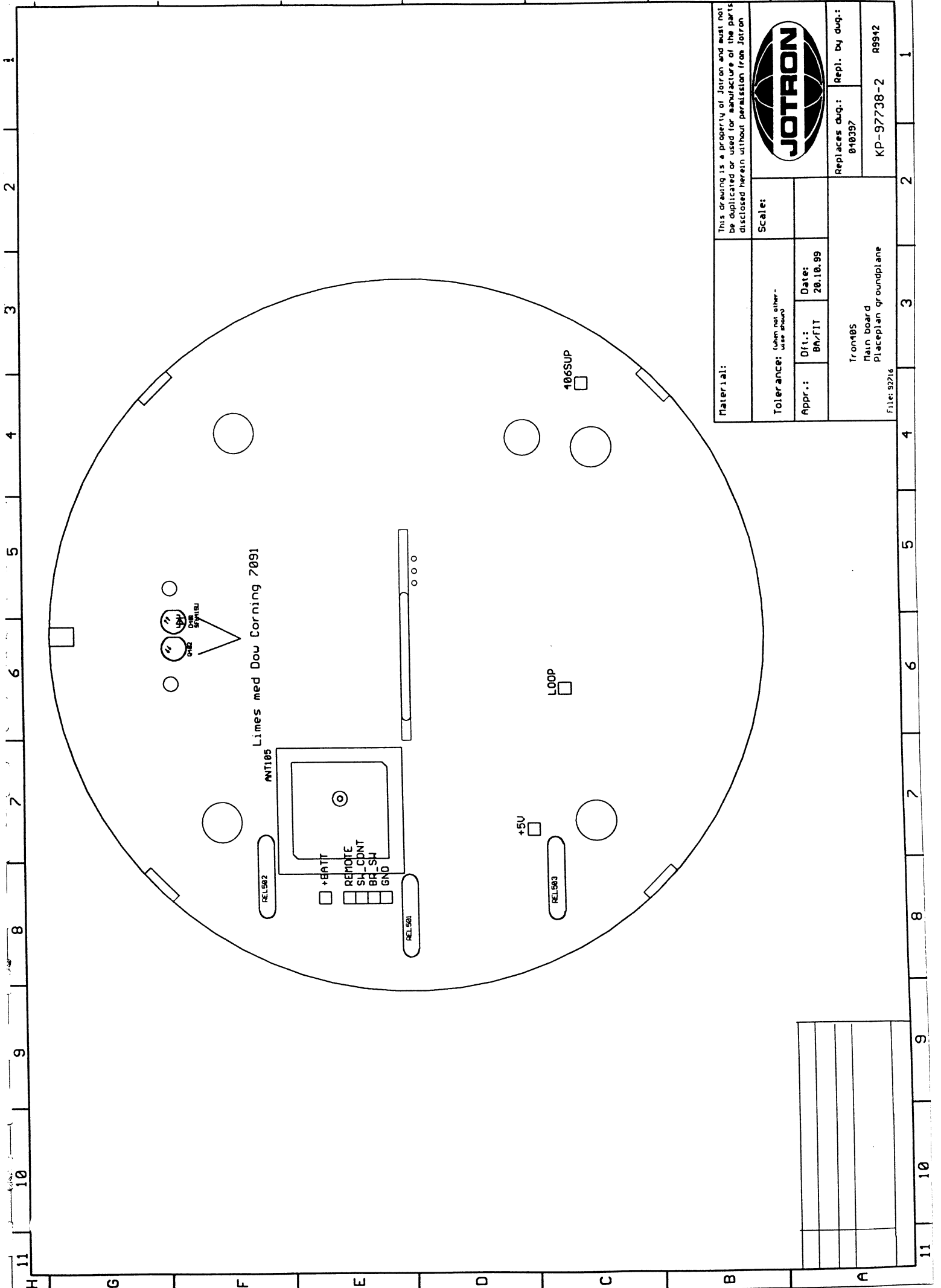


MASKERES FØR DYPPLAKING
MASKERING MED TAPE OVER HULLENE I SKJERBOKS FØR LAKKING.

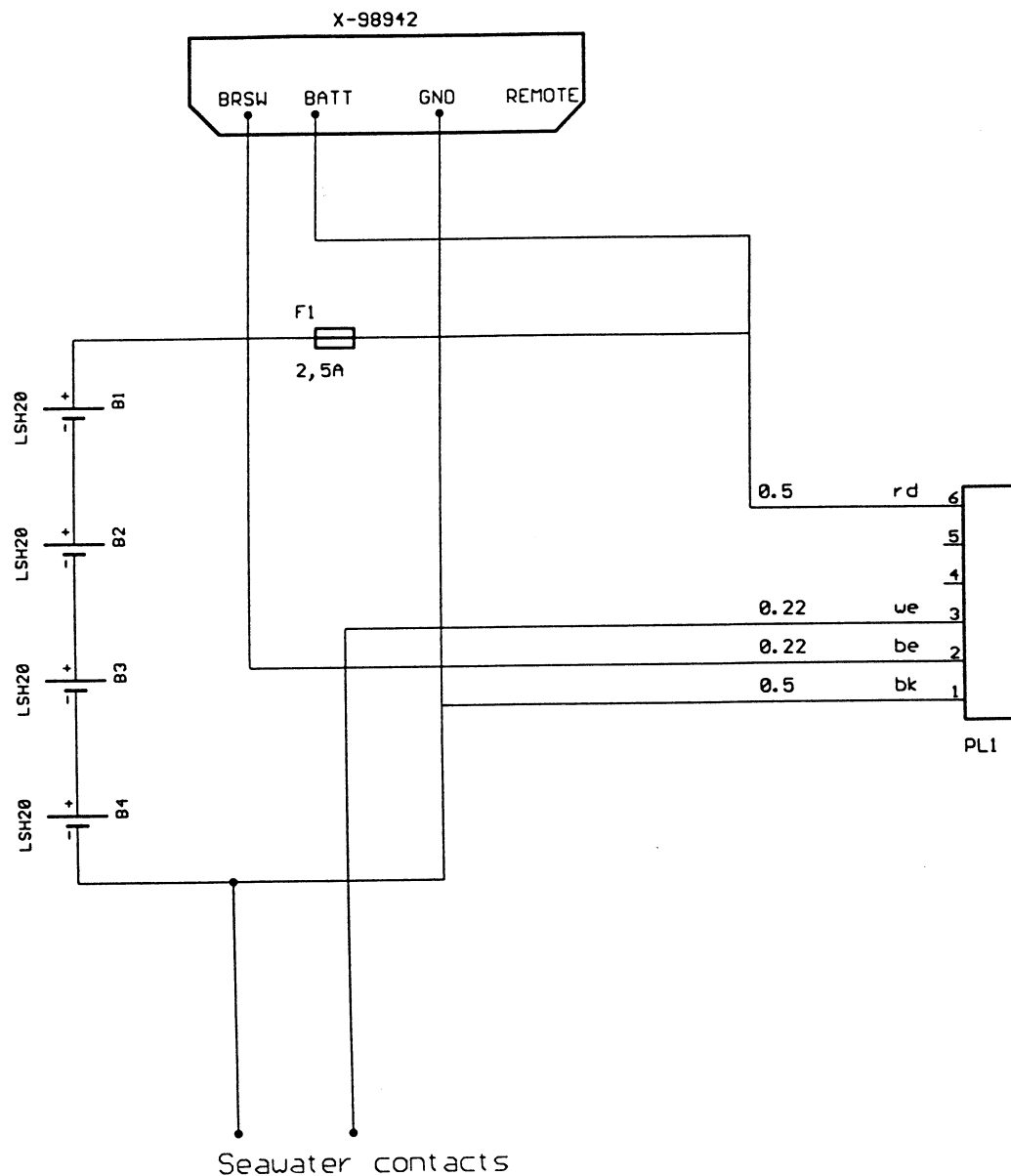
Material:		This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron	
Tolerance: (when not otherwise shown)		Scale:	
Appr.:	Dft.:	Date:	20.10.99
Tron40S Main Board Placeplan component side		Replaces dng.: Repl. by dng.: 26.01.99	
File: 92716		KP-97738-1 R9942	

L101 lites med Dow Corning 7091
NBI Liten mengde slik at fortrinnet område ikke tildekes

EN 3165	MASKERING	260199BJ
EN 1595	Spør for kont. f. endret	010008 BA



Material:		This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron	
Tolerance: (when not otherwise shown)		Scale:	
Appr.:	Dft.: Bn/FIT	Date: 20.10.99	
Tron40S Main board Placeplan groundplane		Replaces aug.: 010397	Repl. by aug.: KP-97738-2 R9942
File: 92716			



Material:

This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron

Tolerance: (when not otherwise shown)

Scale:

Appr.:

Dft.:

BA

Date:

070999

JOTRON
electronics a.s

Battery assembly
Tron40S

Replaces dug.:
090398

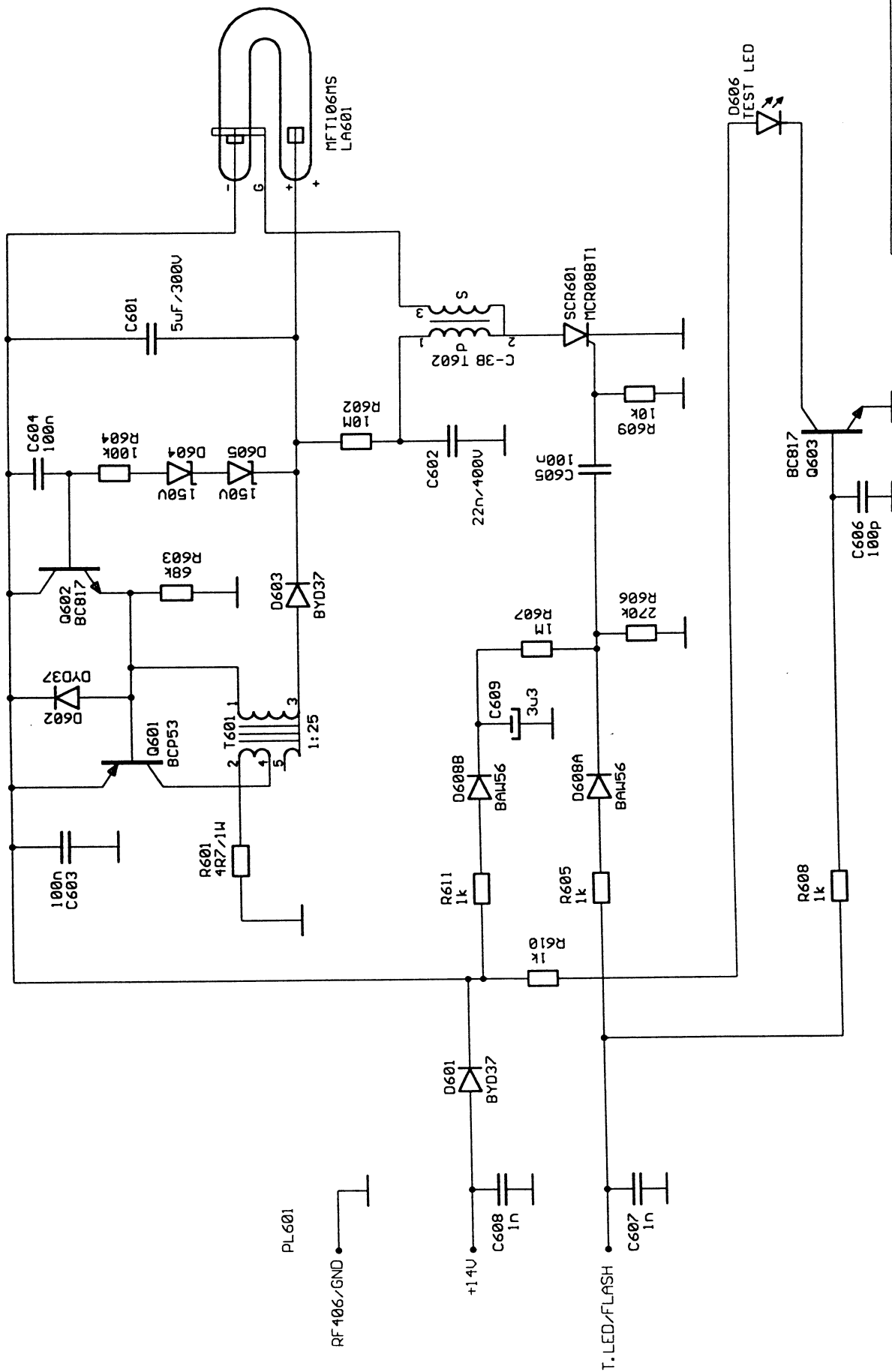
Repl. by dug.:

Circuit drawing

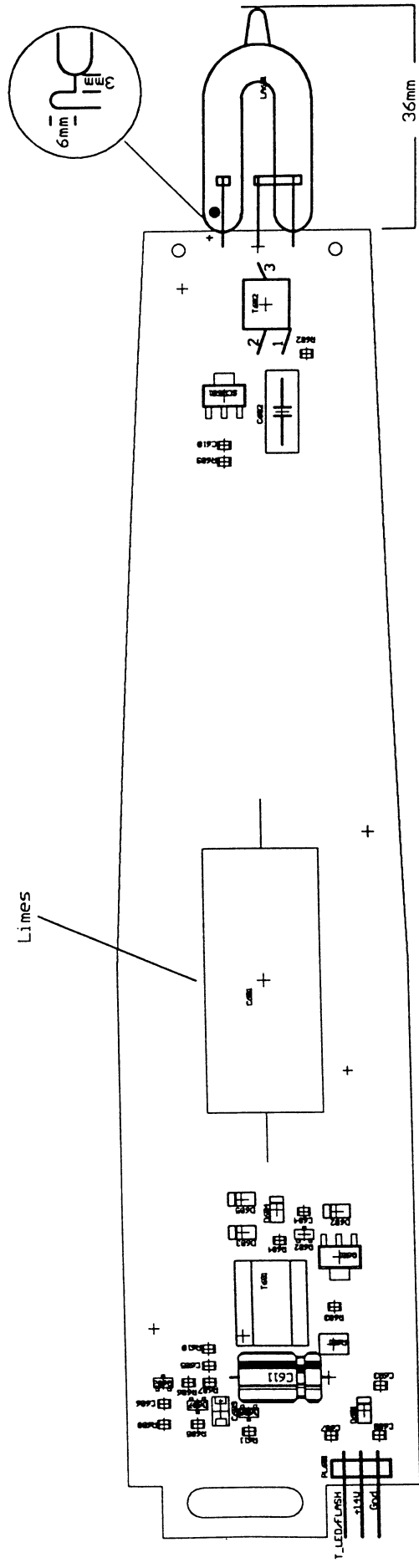
E-97780

EM3351 Sikring 2,5A innføres

EM3048 Safety switch changed



Material:		Scale:	
Tolerance: (when otherwise specified)		Replaces: 051295	
Appr.: D.L. BA	051295	Repl. By: du	
Tron40S		Antenna Board	
JOTRON electronics		E-92718	

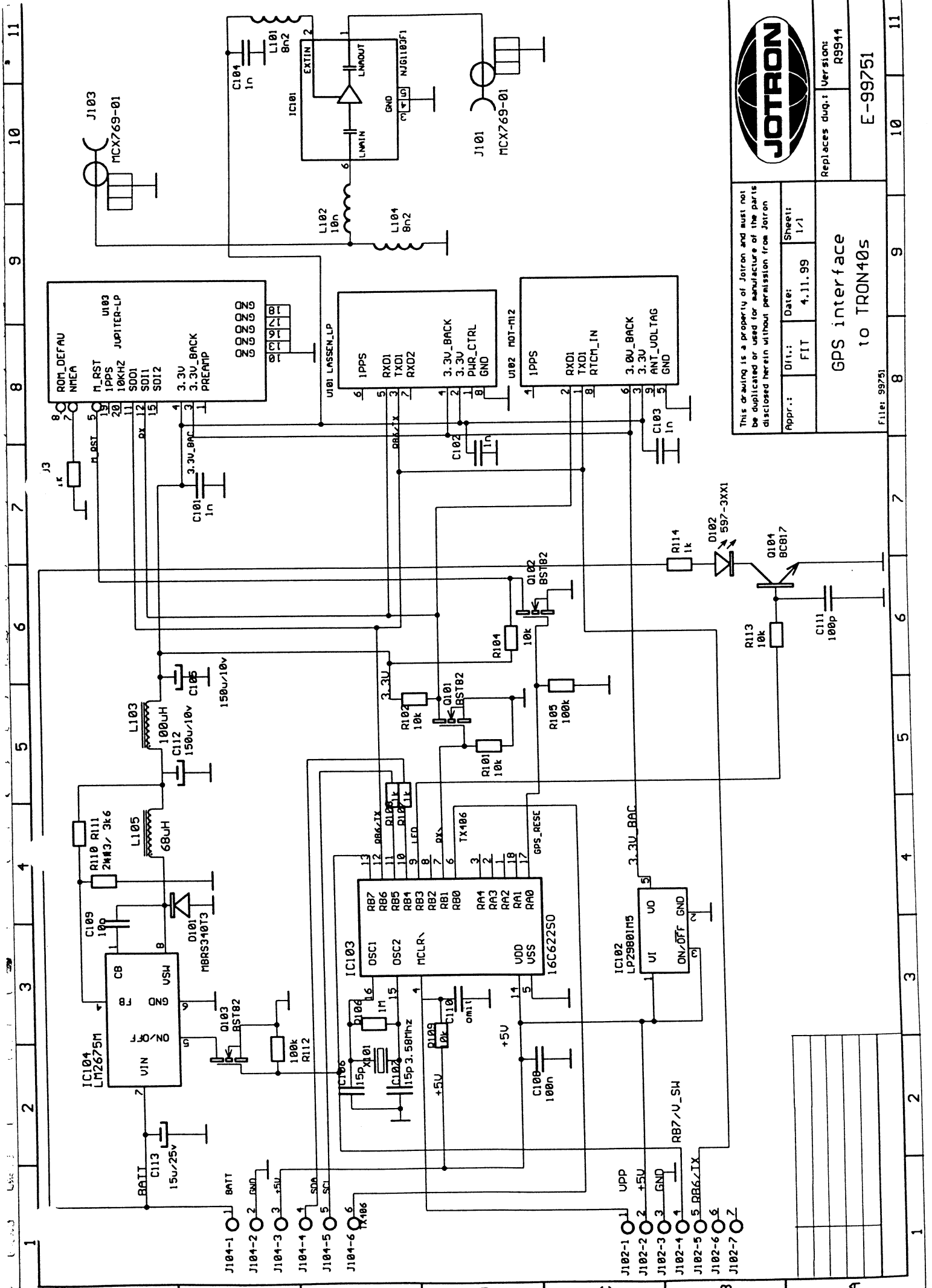


Lim som skal brukes : Dou Corning 7091

+

Material:	This drawing is a property of JOTRON and must not be reproduced or used for manufacture of the part without written permission from Jotron.		
Tolerance:	As per standard	Scale:	
Appr.:	Dft.: BA 040899	Date:	
Tron40S Antenna board Placeplan component side			
Replaces dupl Repl. by dupl 110599			KP-92718-1 rev983

EN 3245	Ny beving av den
EN 3229	Mont. daqslusbr.
Symbol	EN Change



This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron

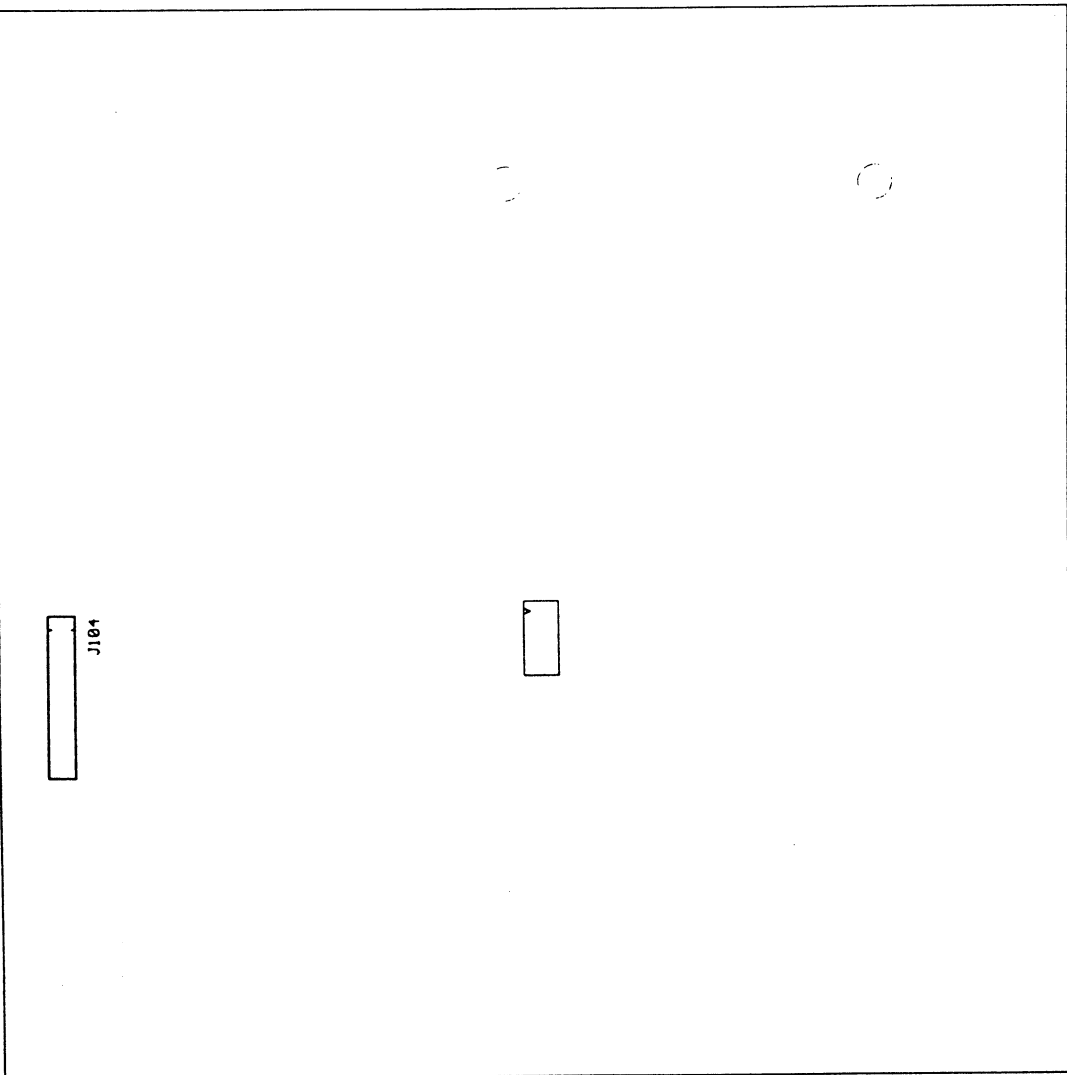
Appr.:	Fit:	Date:	Sheet:
	FIT	4.11.99	1/1

GPS interface
to TRON40S

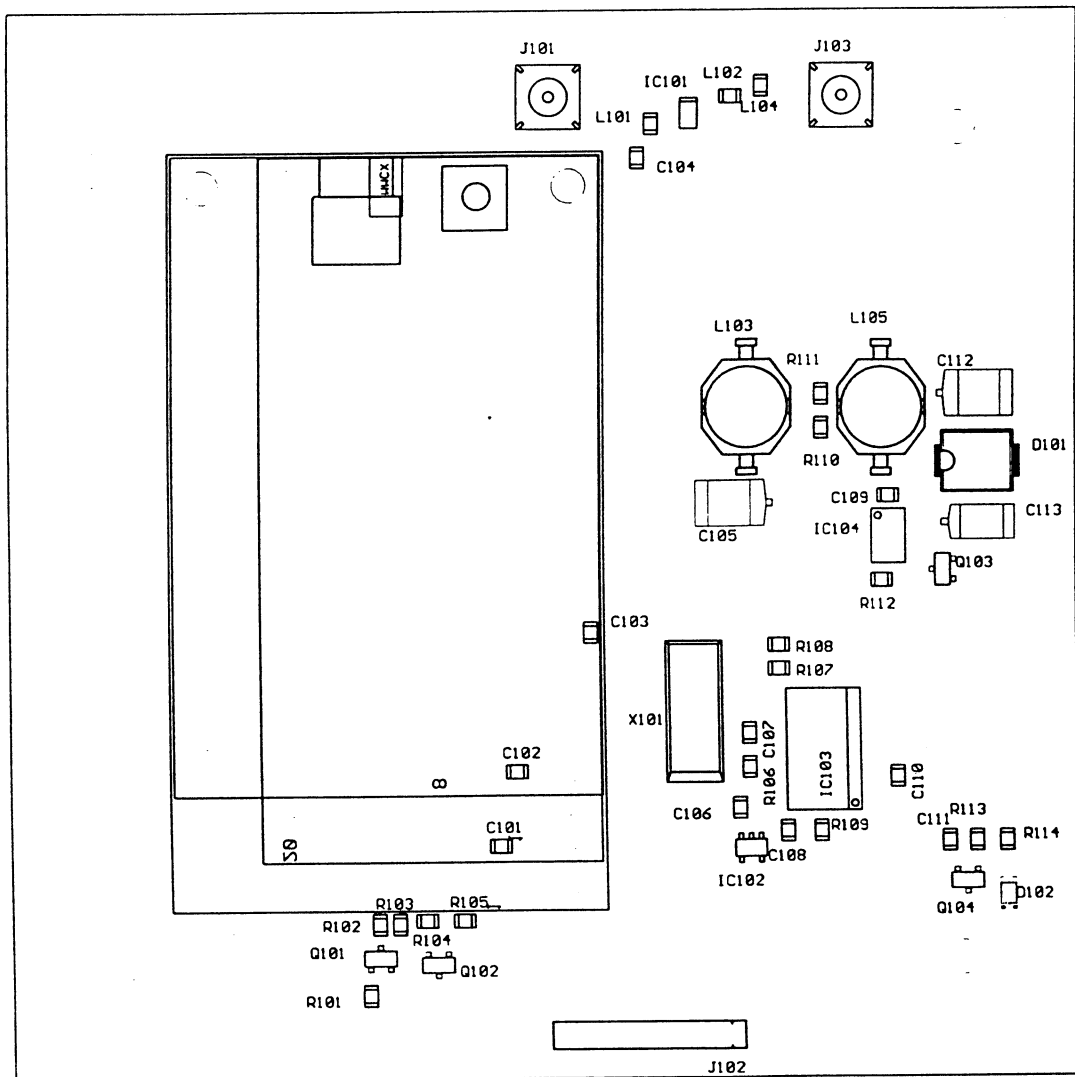
Replaces dup.: Version:
R9944

E-99751

File: 99751



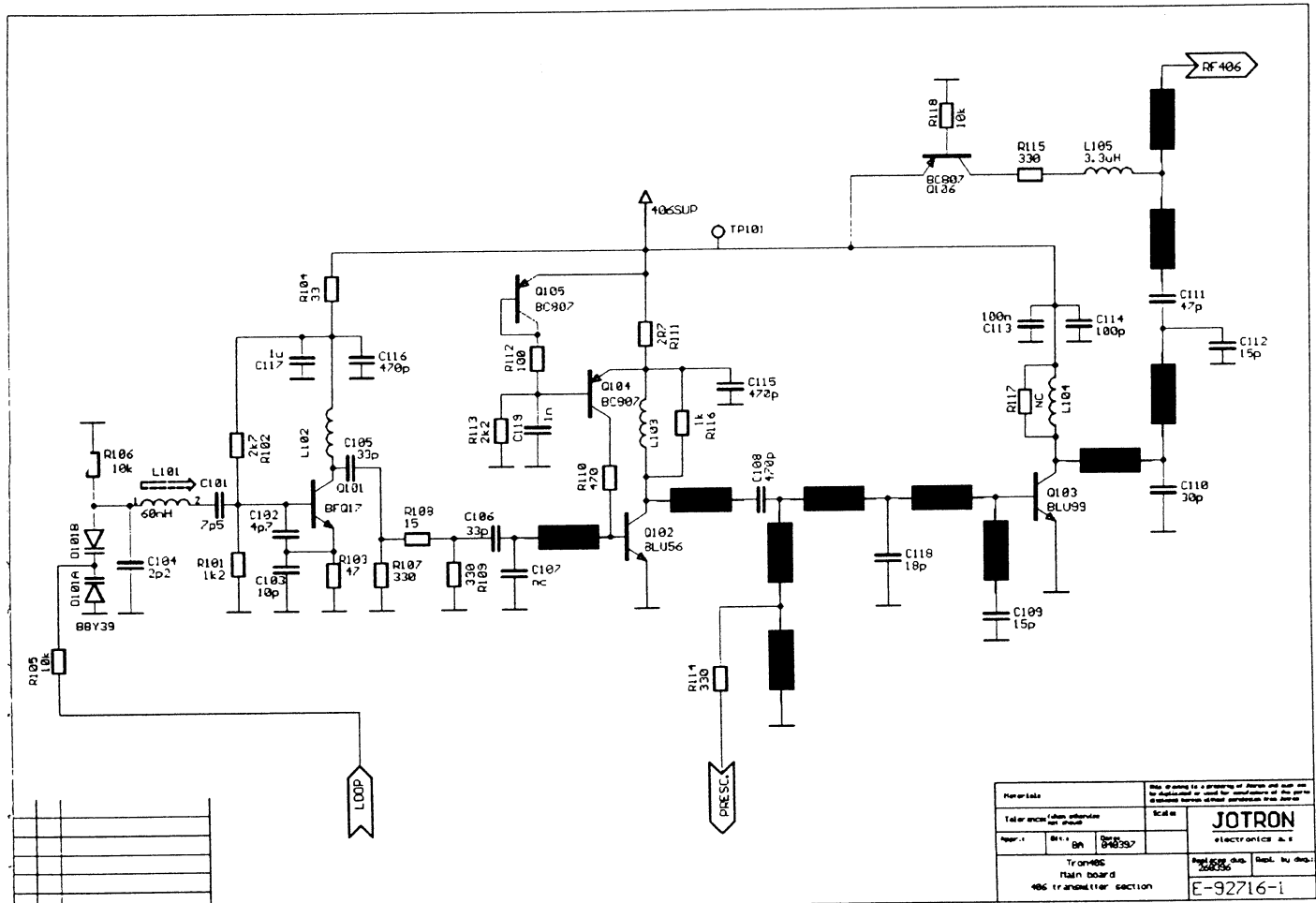
Material:			This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron	
Tolerance: (when not otherwise shown)			Scale:	
Appr.:	Dft.: FIT	Date: 4.11.1999		
Tron 40s GPS Interface			Replaces dug.:	Repl. by dug.:
Jupiter LP/ Motorola M12/Trimble Lassen LP				
Component placement, Bottom layer			KP-99751-2	



Material:			This drawing is a property of Jotron and must not be duplicated or used for manufacture of the parts disclosed herein without permission from Jotron.	
Tolerance: (when not otherwise shown)			Scale:	
Appr.:	Dft.: FIT	Date: 4.11.1999		
Tron 40s GPS Interface			Replaces dng.:	Repl. by dng.:
Jupiter LP/ Motorola M12/Trimble Lassen LP			KP-99751-1	
Component placement, Top layer				

Additional information about differences between standard TRON40S and TRON40GPS:

I have attached schematic and board diagrams of the standard Tron40s and of the Tron40GPS:



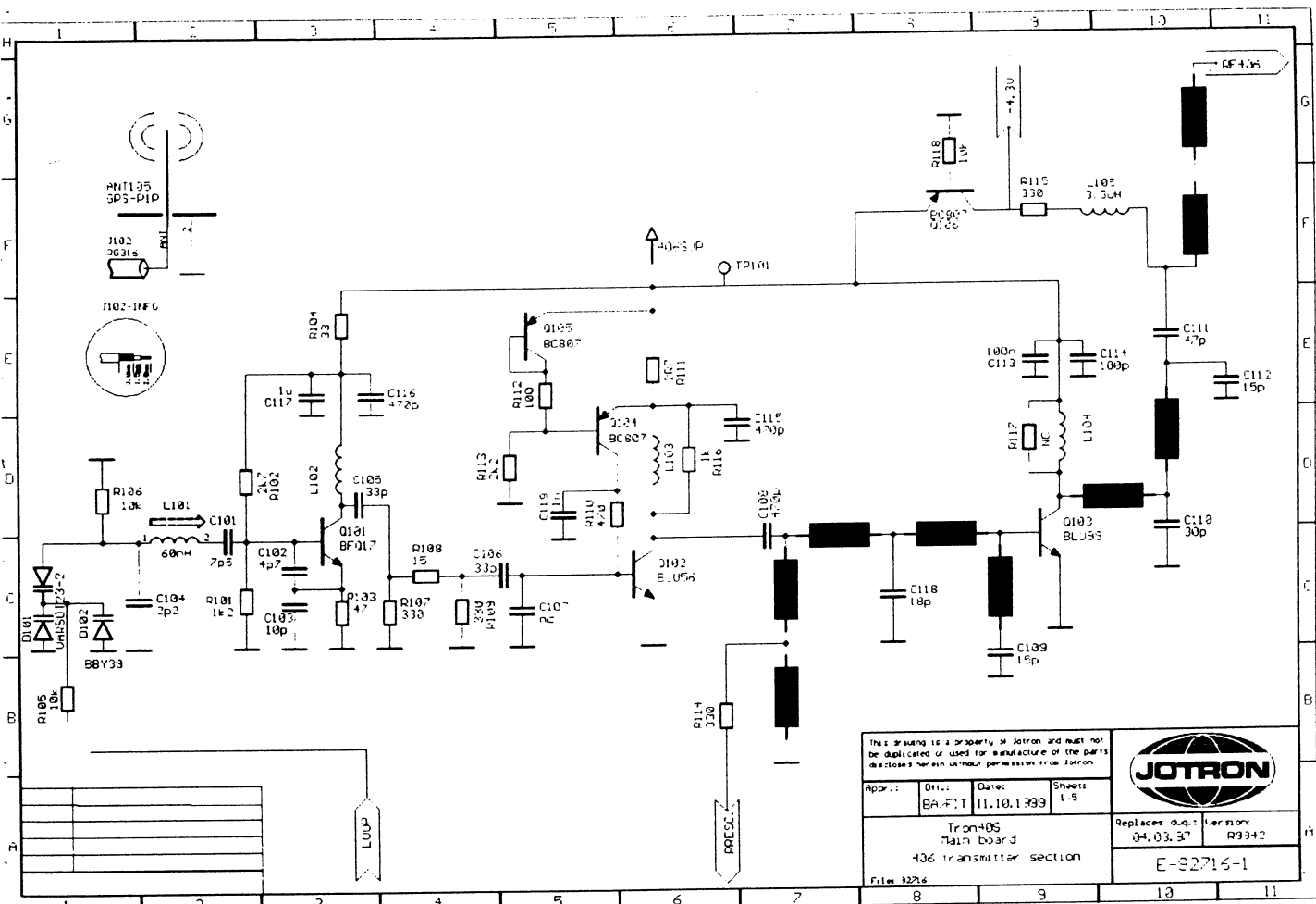


Figure 2 Schematic no.1 of TRON40S/GPS 406 Transmitter section

Note that the only difference between the standard 406 Transmitter section and the new schematic are the GPS antenna in the left upper corner, other differences are only corrections of minor errors in the schematic.

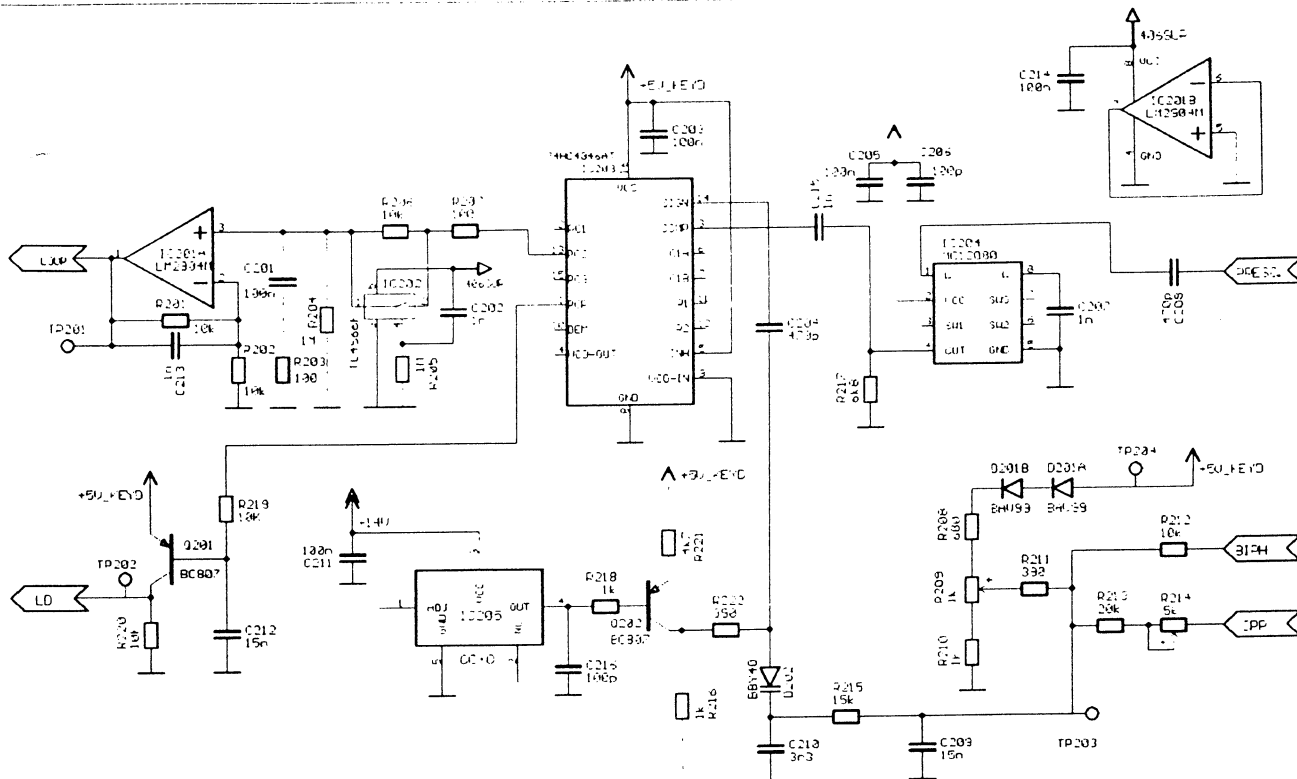


Figure 3 TRON40S, 406 PLL section

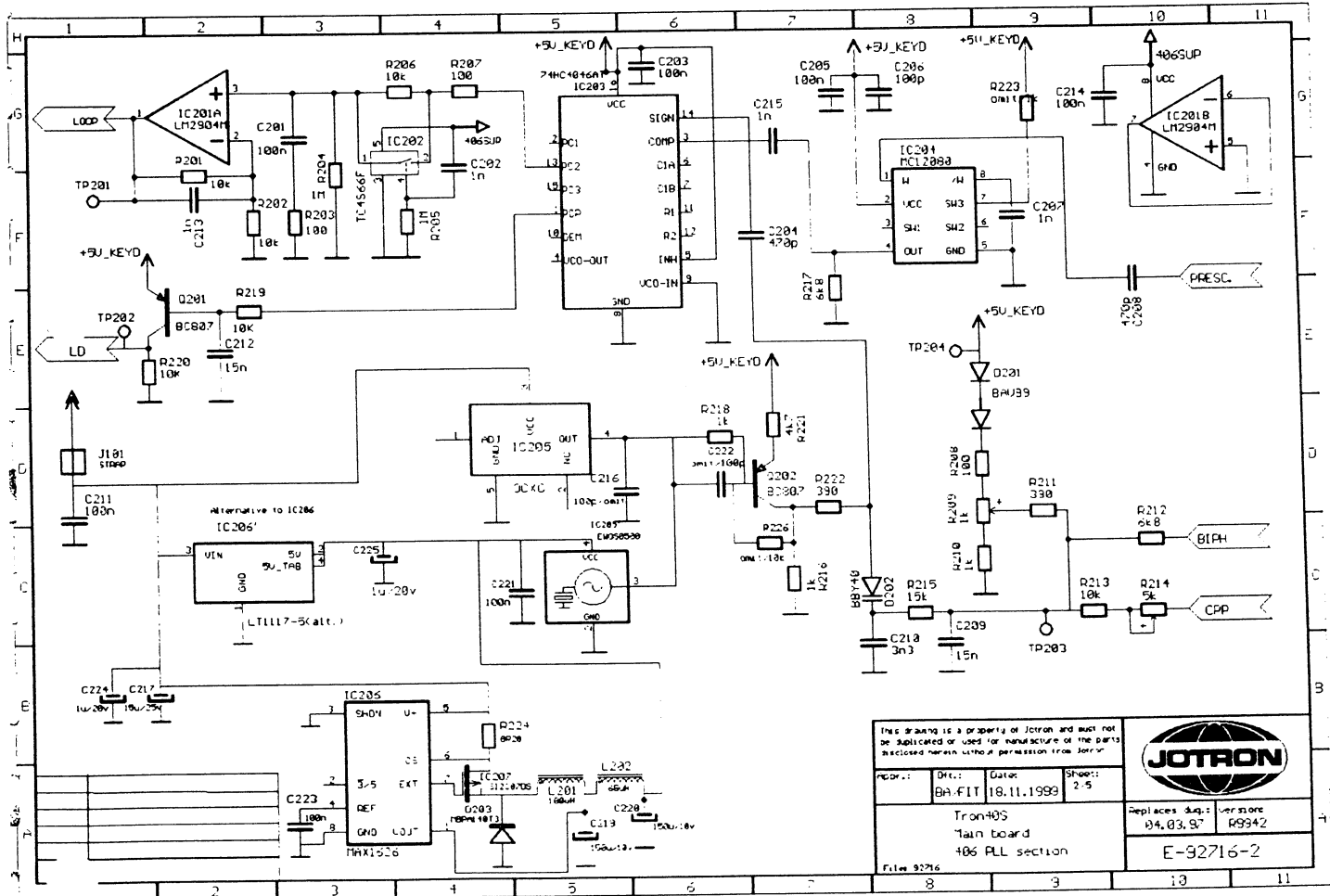


Figure 4 TRON40S/GPS 406 PLL section

Alternative oscillator OCXO:(Figure 4)

in the 406 PLL section the differences are that there are inserted an option of using another oscillator (IC205'), the SOREP EWOS0500 at the double frequency of the standard oscillator (IC205). The EWOS0500 are the same oscillator used in our TRON45S and since it operates at the double frequency, the divider IC204 must be changed from /80 to /40 by mounting a resistor R223. The reason that we chose this oscillator as an alternative is that the current consumption of this oscillator are less than the standard FORDAHL oscillator, and when GPS is mounted, the overall current consumption should not be much more than a standard TRON40S without GPS. Since the SOREP EWOS0500 oscillator runs at +5v instead of the FORDAHL who runs at +12v, we had to use a switch regulator to get the voltage down to +5v. This is the IC206, (MAX1626) with additional circuitry around as seen at the low left corner of figure 4. If the noise from the switch regulator is too loud, we have to use the alternative linear regulator IC206' (Linear Tech. LT1117-5) instead.

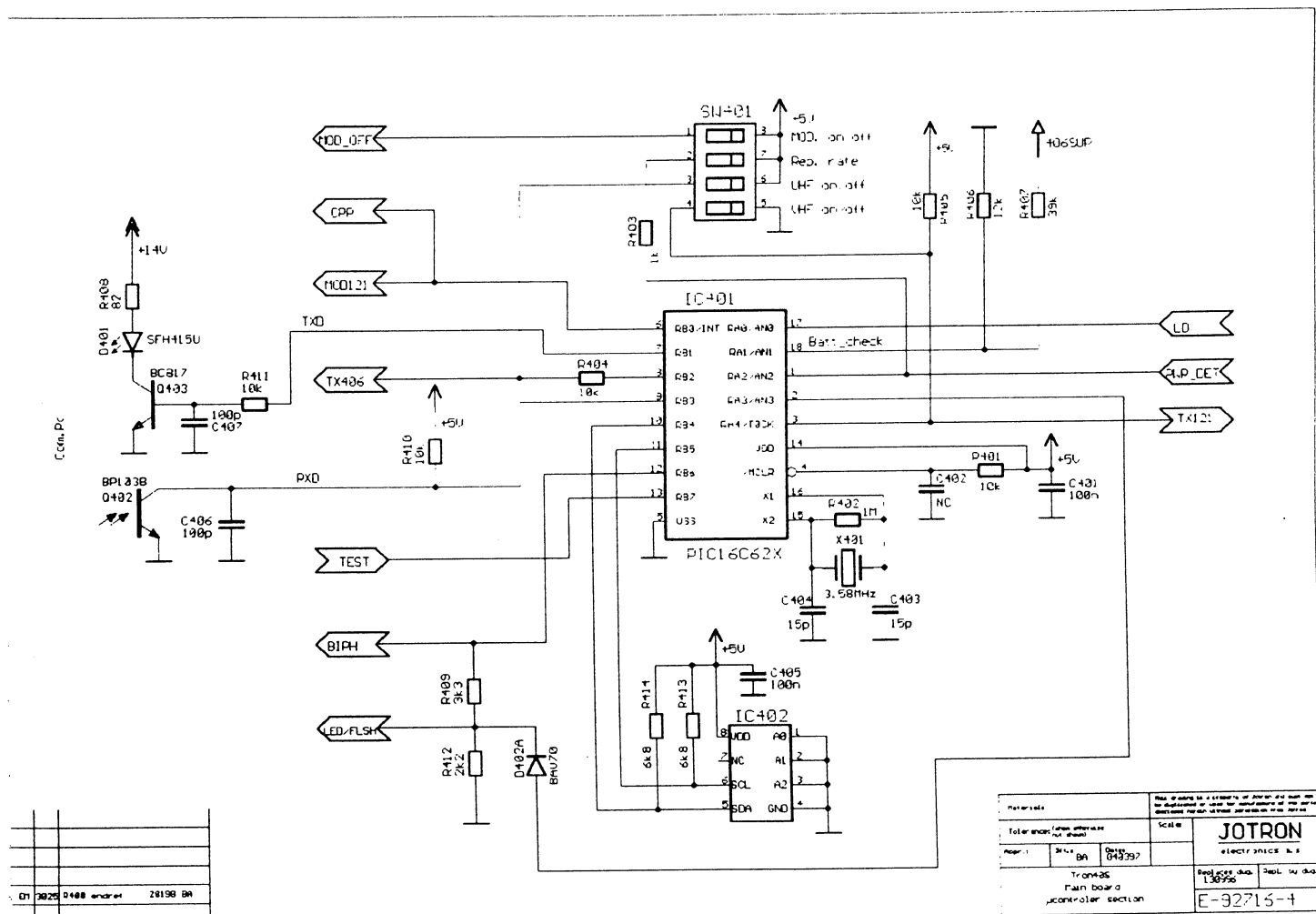
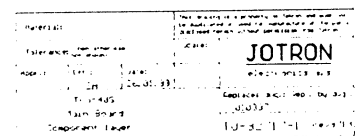


Fig. 5 Tron 40s microcontroller section

An Interface Header has been added to the main board so that mounting a GPS interface and GPS receiver is possible. The communication between the GPS interface board and the Main board is through the I2C lines SCL (Serial Clock Line) and SDA (Serial Data) to the memory IC402 which are an EEPROM where the Programmed data from the programming station are stored. This solution was in mind when the Tron 40s was designed in 1996 and has now been implemented.



REF	QTY	DESCRIPTION	LOCATION
1	1	IC1	U1
2	1	IC2	U2
3	1	IC3	U3
4	1	IC4	U4
5	1	IC5	U5
6	1	IC6	U6
7	1	IC7	U7
8	1	IC8	U8
9	1	IC9	U9
10	1	IC10	U10
11	1	IC11	U11
12	1	IC12	U12
13	1	IC13	U13
14	1	IC14	U14
15	1	IC15	U15
16	1	IC16	U16
17	1	IC17	U17
18	1	IC18	U18
19	1	IC19	U19
20	1	IC20	U20
21	1	IC21	U21
22	1	IC22	U22
23	1	IC23	U23
24	1	IC24	U24
25	1	IC25	U25
26	1	IC26	U26
27	1	IC27	U27
28	1	IC28	U28
29	1	IC29	U29
30	1	IC30	U30
31	1	IC31	U31
32	1	IC32	U32
33	1	IC33	U33
34	1	IC34	U34
35	1	IC35	U35
36	1	IC36	U36
37	1	IC37	U37
38	1	IC38	U38
39	1	IC39	U39
40	1	IC40	U40
41	1	IC41	U41
42	1	IC42	U42
43	1	IC43	U43
44	1	IC44	U44
45	1	IC45	U45
46	1	IC46	U46
47	1	IC47	U47
48	1	IC48	U48
49	1	IC49	U49
50	1	IC50	U50
51	1	IC51	U51
52	1	IC52	U52
53	1	IC53	U53
54	1	IC54	U54
55	1	IC55	U55
56	1	IC56	U56
57	1	IC57	U57
58	1	IC58	U58
59	1	IC59	U59
60	1	IC60	U60
61	1	IC61	U61
62	1	IC62	U62
63	1	IC63	U63
64	1	IC64	U64
65	1	IC65	U65
66	1	IC66	U66
67	1	IC67	U67
68	1	IC68	U68
69	1	IC69	U69
70	1	IC70	U70
71	1	IC71	U71
72	1	IC72	U72
73	1	IC73	U73
74	1	IC74	U74
75	1	IC75	U75
76	1	IC76	U76
77	1	IC77	U77
78	1	IC78	U78
79	1	IC79	U79
80	1	IC80	U80
81	1	IC81	U81
82	1	IC82	U82
83	1	IC83	U83
84	1	IC84	U84
85	1	IC85	U85
86	1	IC86	U86
87	1	IC87	U87
88	1	IC88	U88
89	1	IC89	U89
90	1	IC90	U90
91	1	IC91	U91
92	1	IC92	U92
93	1	IC93	U93
94	1	IC94	U94
95	1	IC95	U95
96	1	IC96	U96
97	1	IC97	U

Note new GPS interface connector at D7/D8 and additional ground plane around new oscillator/ Switch mode supply.(F5/F6)

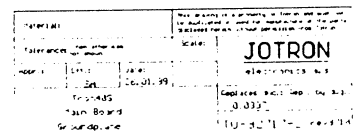


Figure 3: Front view, main board.

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No major differences here.

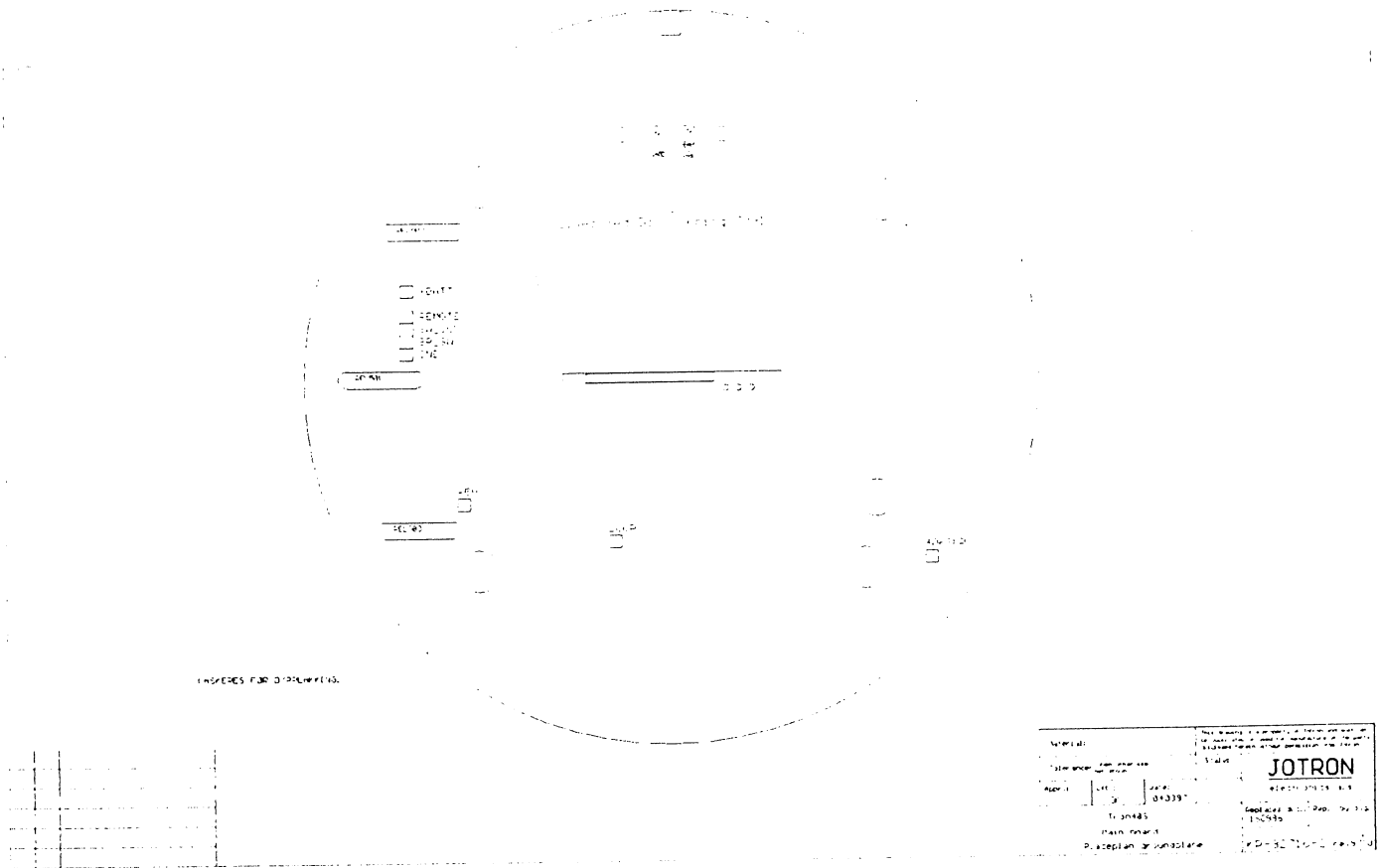


Figure 13 Tron40S, Main Board , Placeplan Groundplane

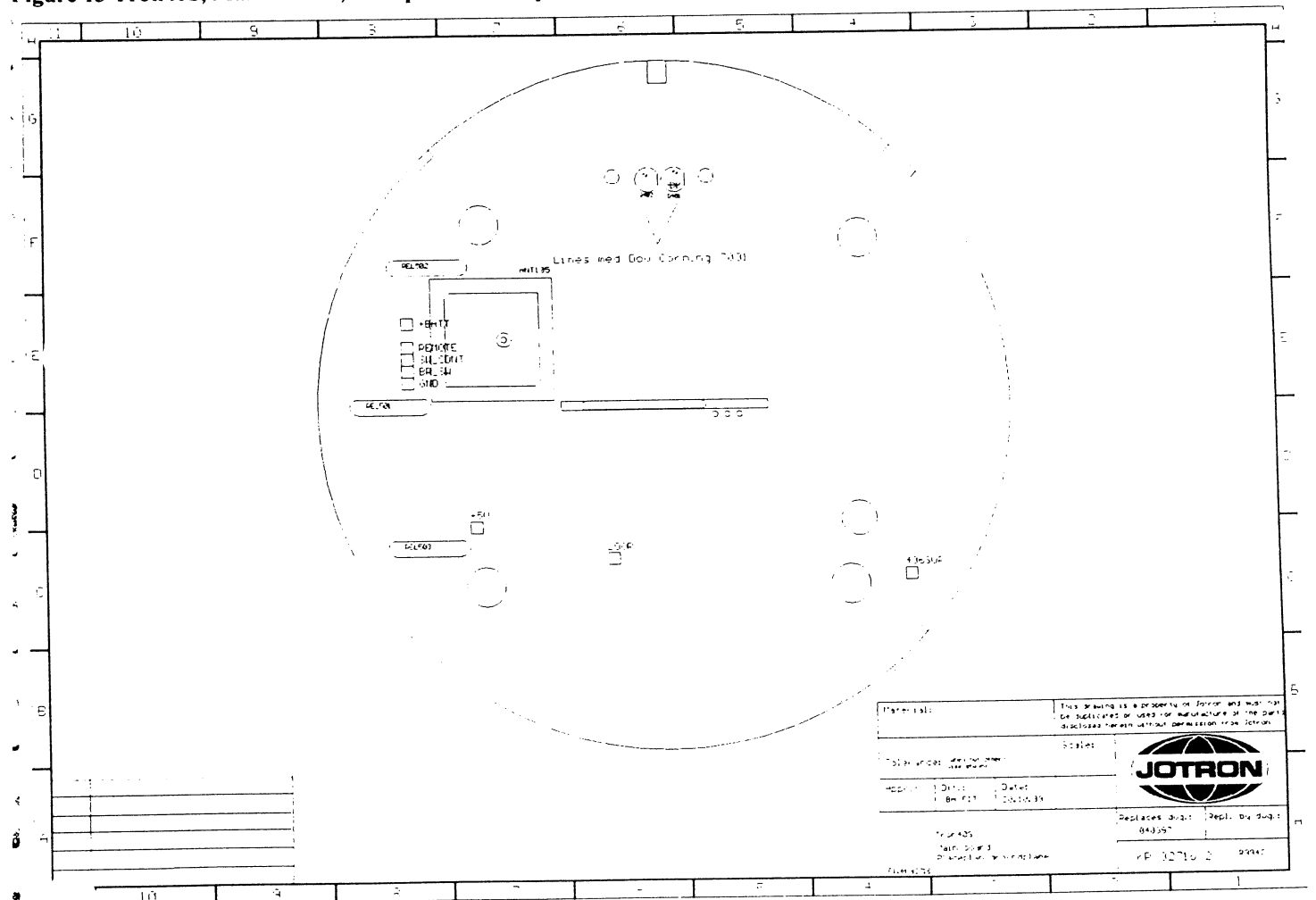


Figure 14 Tron40S/GPS, Main Board , Placeplan Groundplane

Note GPS antenna at E7.

All of the information above are made to clarify the differences between the standard Tron40S mainboard and the new main board which can be used both for standard Tron40S and the new Tron40GPS which will have an GPS interface board and a GPS receiver mounted under the Main Board. The GPS Interface board are made with its own microcontroller 16c62x which have NMEA0183 protocol to the three GPS receivers which are possible to mount (Connexant (Formerly Rockwell) JUPITER LP, Trimble Lassen LP and Motorola Oncore M12). The microcontroller control ON and OFF of the GPS receiver and store data to the EEPROM, IC402 when a valid longitude/latitude are received.

Fred Ivar Tallaksen
R & D JOTRON electronics a.s