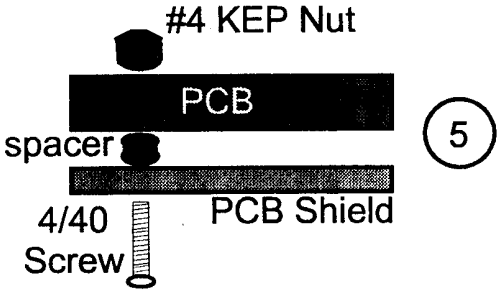
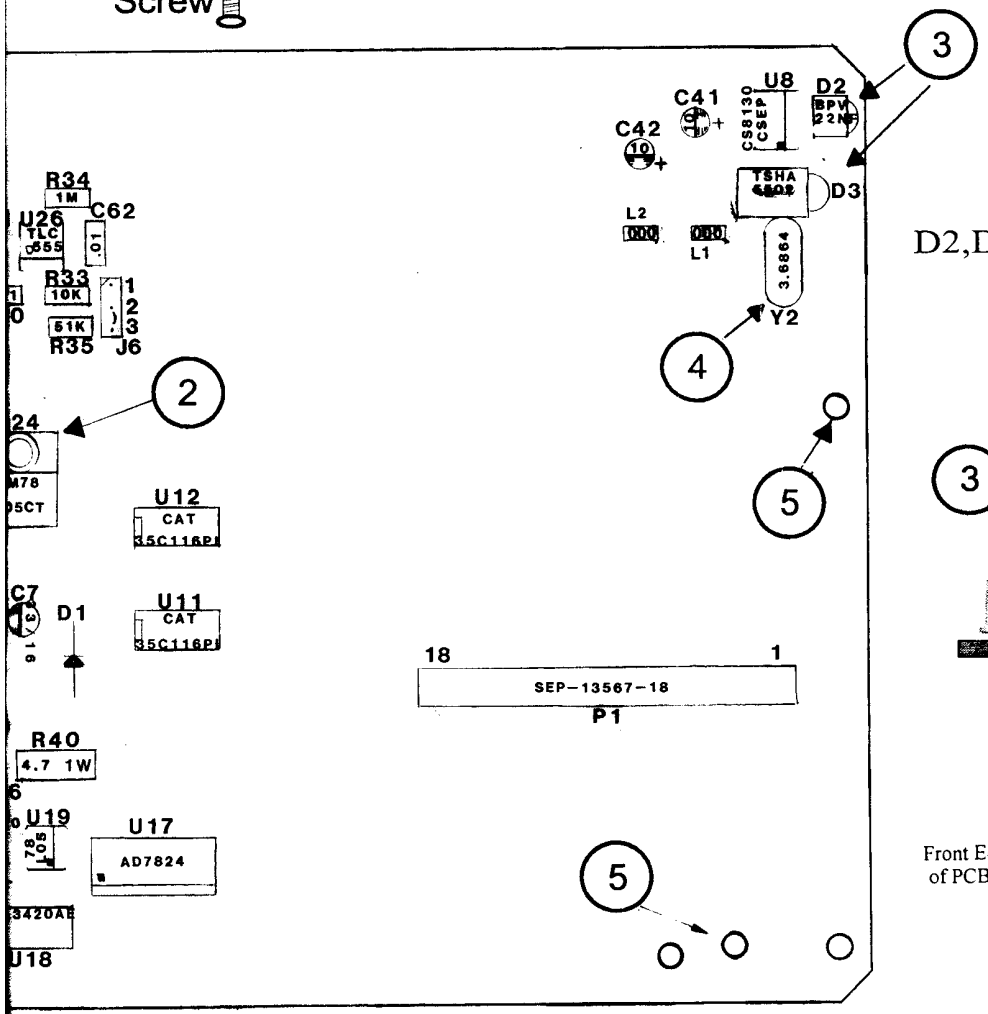
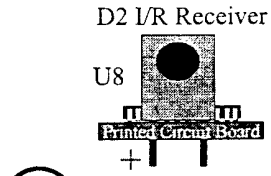
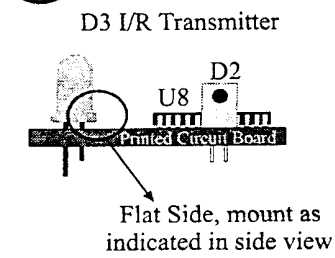
REV.	ZONE	PER ECN NO.	INITIAL & DATE DRAWN	INITIAL & DATE APPROVED	REV	ZONE	PER ECN NO.	INITIAL & DATE DRAWN
2	ALL	192-01	AC 2/96	AC 1/97				
2		192-03	A 5/97	A 5/97				
2		192-07	A 12/97	A 12/97				





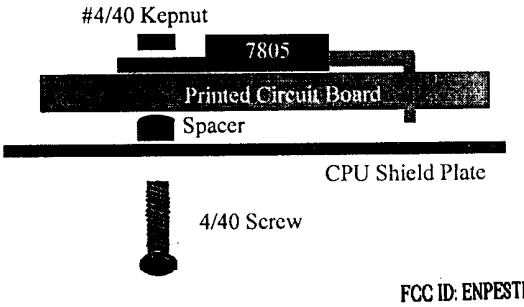
D2,D3- I/R LED Mounting

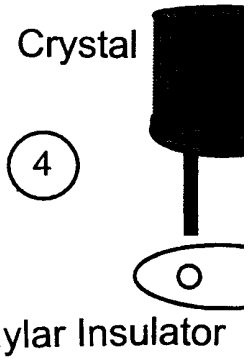




lotes

2 U24 Regulator Mounting Diagram





facing the front of

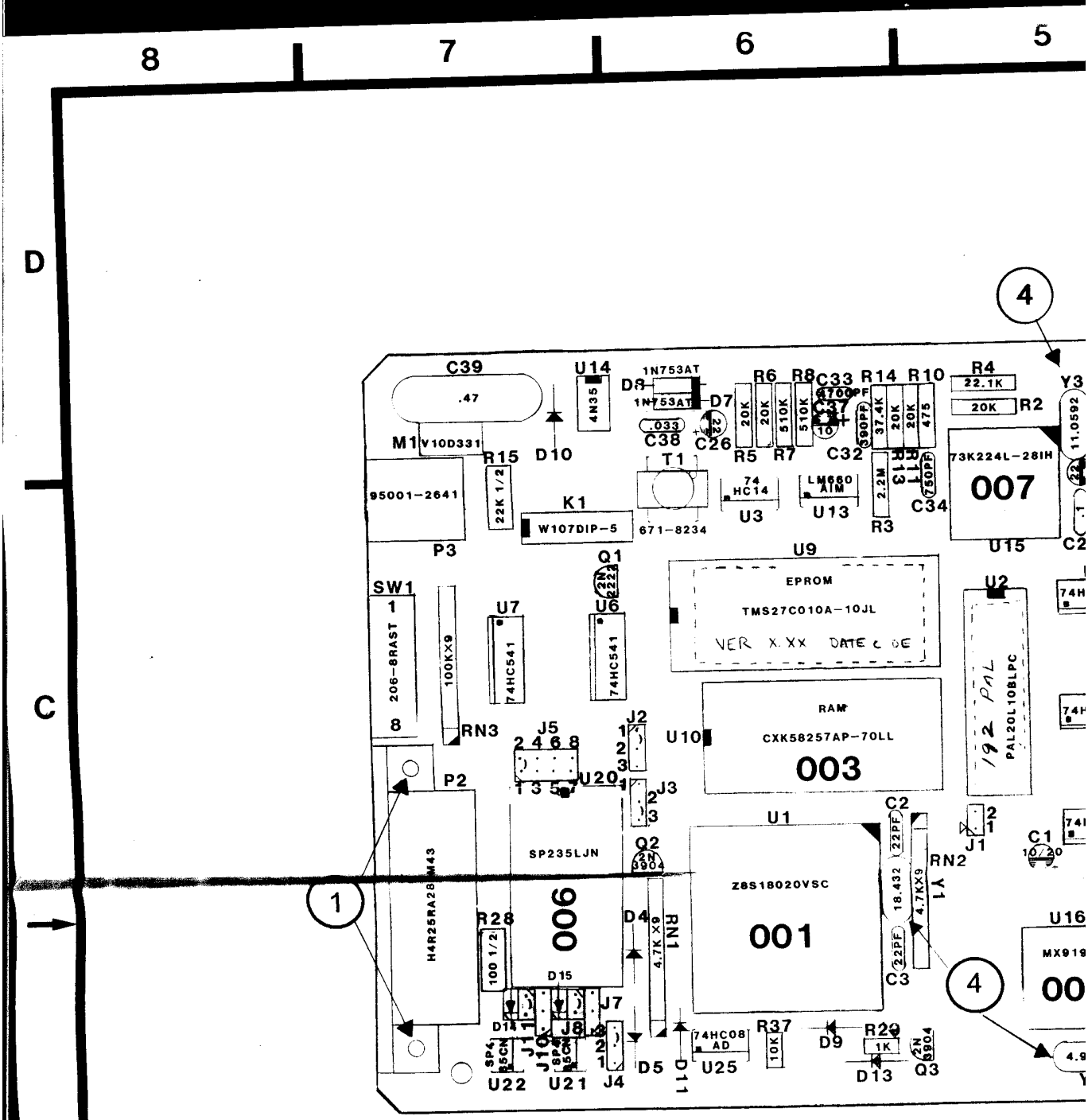
e of part Silkscreen.
4 and P2 mounting

Option.

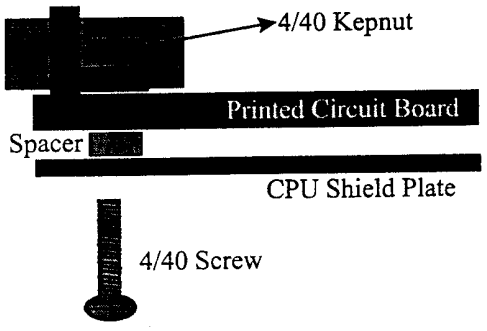
he Signal Strength option is requested:

FCC ID: ENPESTEEM192M

DESIGNED	RELEASES PREL. 6/96	EST	ELECTRONIC SYS TECHNOLOG
DRAWN DM	PROTO.		
CHECKED AC 8/96	QUAL. 8/96		
UNLESS OTHERWISE SPECIFIED TOLERANCES DECIMAL .XX ±.010 .XXX ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2	PROD. 8/96		
	NEXT ASSY. 80A13/14	SYSTEM	192 ESTEEM
	REFERENCE DWG. A00373	TITLE	192CPU ASSEMBLY COMP SIDE



P2 Connector Mounting Diagram



ESTeem 192 CPU

Top

All resistors values are in ohms and are 1/8 watt unless noted o
All capacitor values are in micro farads unless noted otherwise.
Capacitor C7 is 33µF, 16Vdc.
Capacitors C1 and C46 are 10µF, 20 Vdc.
Capacitors C37, C41, and C42 are 10µF, 10 Vdc.

Capacitor C47 is 1µF, 35Vdc.
Diodes D1, D4, D5, D11, and D13 are 1N4148 or accepted ec
Diodes D9 and D12 are SD103 or accepted equivalent.
. Install Diode D3 with the flat side of IR LED facing U8. Insta
the Printed Circuit Board. **See D2 - D3 IR LED mounting d**
Apply Heatsink compound to the bottom of U24.
Install mini-shunts at J1, J2, J3, J4, J5, J8, and J11
P1 connector installed on solder side of PCB after wave solde
Install #4 X 1/8" spacer between CPU PCB and CPU Shield
diagrams.
. Install mylar insulator(s) under crystals Y1, Y2, Y3, and Y4 a

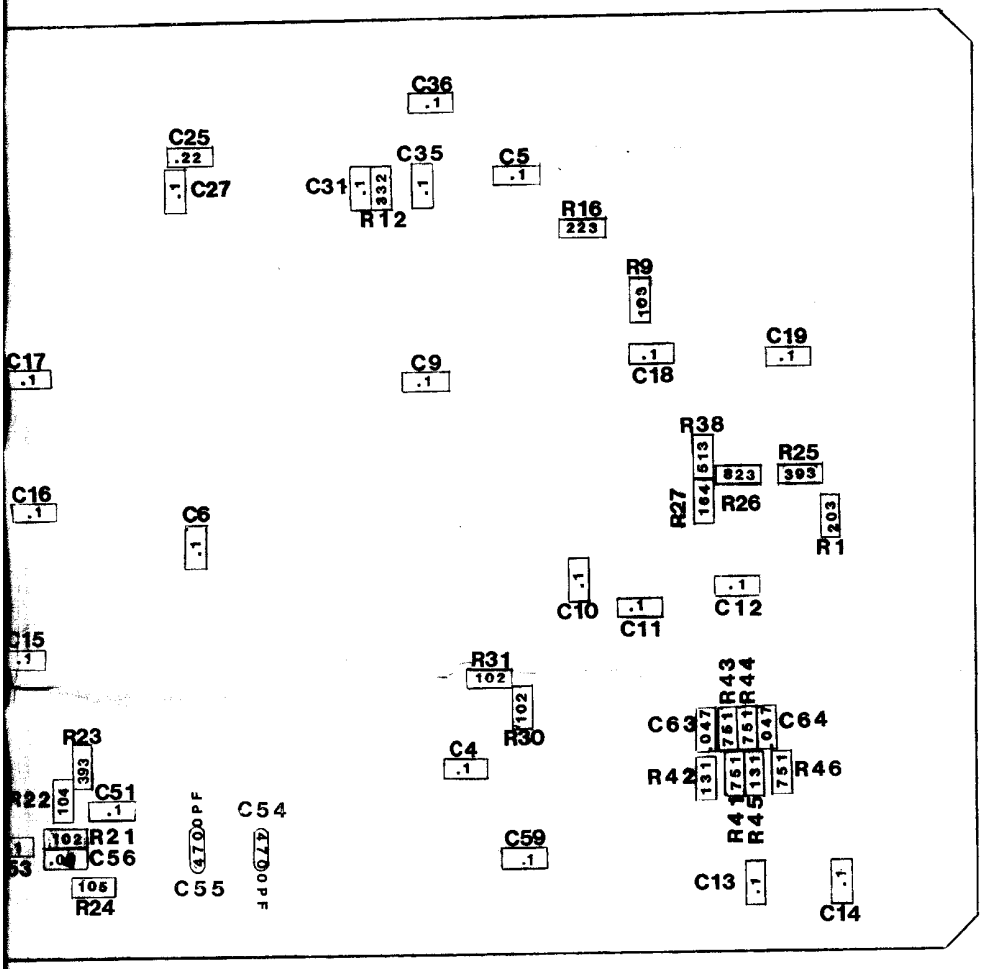
The following parts are *not installed unless the Phone option is requested:*

- ***Surge Suppressor M1***
- ***Capacitors C22 thru C29, and C30 thru 39.***
- ***Diodes D7, D8 and D10.***
- ***Resistors R2 thru R16.***
- ***Crystal Y3***

The following parts are *no*

- ***ICs U17, U18, and U***

REV.	ZONE	PER ECN NO.	INITIAL & DATE DRAWN	INITIAL & DATE APPROVED
2	ALL	192-01	AC	12/96
2	ALL	192-03	[illegible]	5/97
2	ALL	192-07	[illegible]	12/97



FCC ID: ENPESTEEM192M

DESIGNED	RELEASES: PREL.	EST	ELECTRONIC SYS TECHNOLOG
DRAWN	PROTO.		
CHECKED AC 8/96	QUAL. 8/96		
UNLESS OTHERWISE SPECIFIED TOLERANCES DECIMAL XX ±.010 XXX ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2 ±.004	PROD. 8/96		
	NEXT ASSY. 80A13/14	SYSTEM 192 ESTEEM	
	REFERENCE DWG. A00373	TITLE 192 CPU ASSEMBLY SOLDER SIDE	
		SCALE	SIZE	DWG & PART NO.

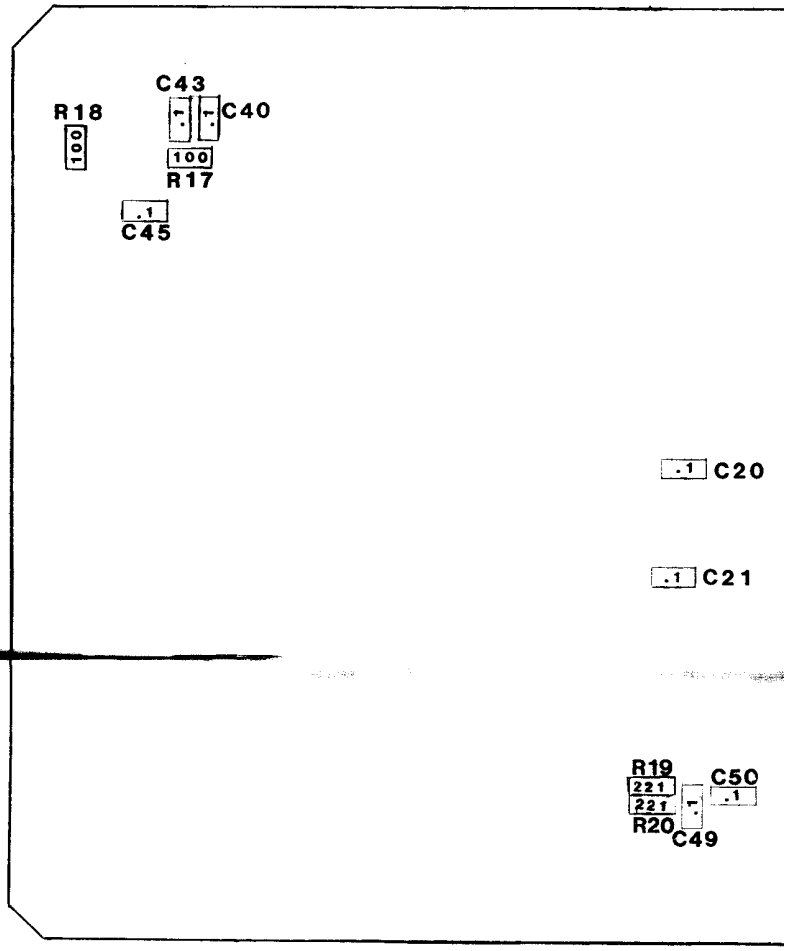
8 7 6 5

D C B A

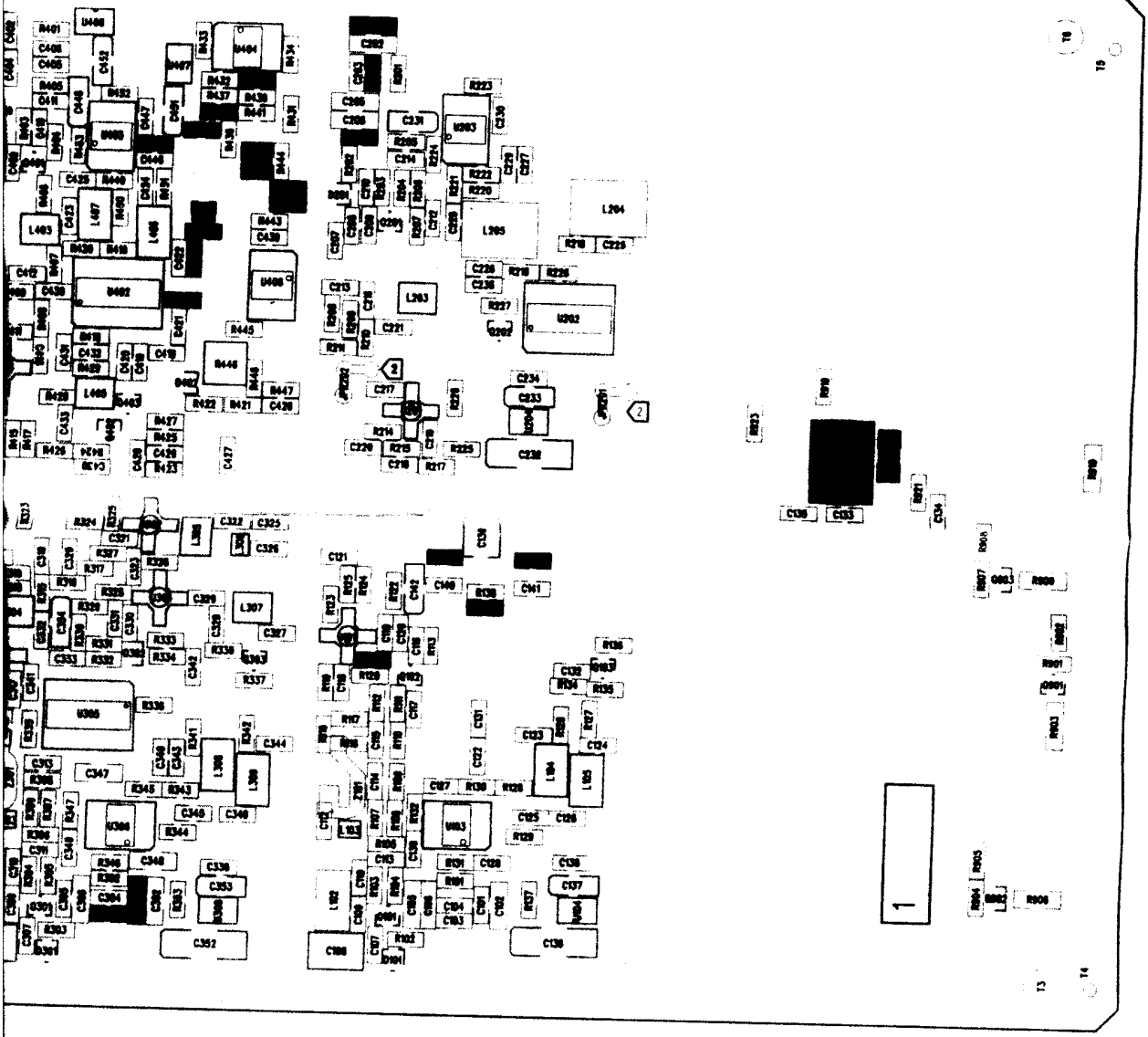
ESTeem 192 CPU Assembly Notes

Bottom Side

1. All resistors are 1/8 watt, 5% tolerance, chip size 1206 unless otherwise noted.
2. All resistor values are in ohms. Mount all chip resistors with the value markings visible.
3. All capacitors are chip size 1206.



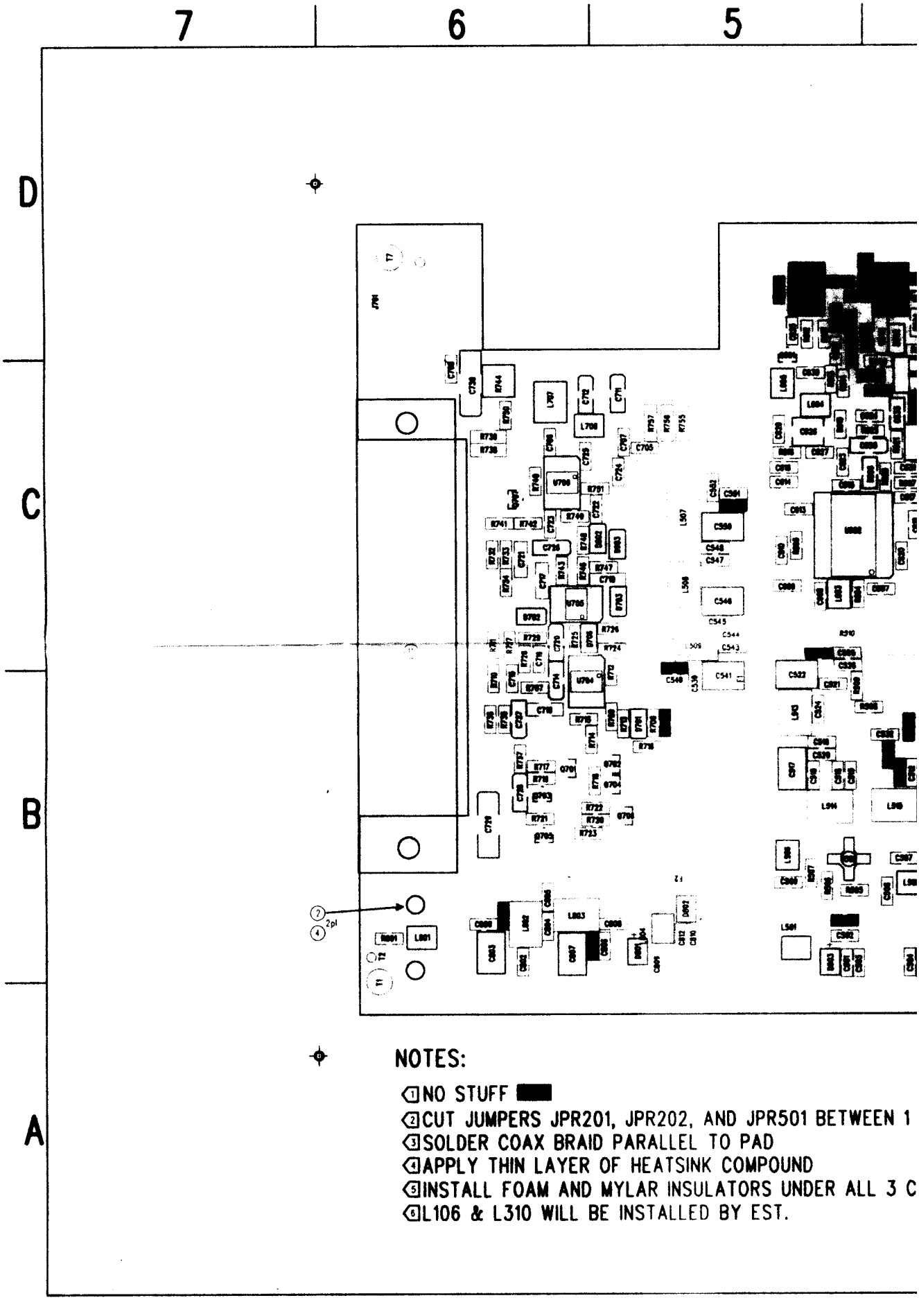
DRAWN	REV.	ECO #	DESCRIPTION	CHECK:	DATE



FCC ID: ENPESTEEM192M

DESIGNED: IDAFAB	RELEASE: PRE-L	ESL	ELECTRONIC SYSTEMS TECHNOLOGY
DRAWN: C.CLARK	PROTO.		
CHECKED	QUAL.		
UNLESS OTHERWISE SPECIFIED TOLERANCES	PROD.	NEXT ASSY: 80A014	SYSTEM: 192M WIRELESS MODEM
DECIMAL .XX +/- .010, .XXX +/- .005		DWG. NUMBER: B00407	TITLE: TXRX ASSEMBLY DRAWING
FRACTIONAL +/- 1/64			
ANGULAR +/- 1/2			
HOLE +/- .004, +/- .002			
ALL DIMENSIONS IN INCHES DO NOT SCALE THIS DWG		SHEET 1 OF 2	SCALE: N/A, SIZE: C, PART NO: 80B0160200A, REV: A

TAIL "B"



NOTES:

<1> NO STUFF ■

<2> CUT JUMPERS JPR201, JPR202, AND JPR501 BETWEEN 1

<3> SOLDER COAX BRAID PARALLEL TO PAD

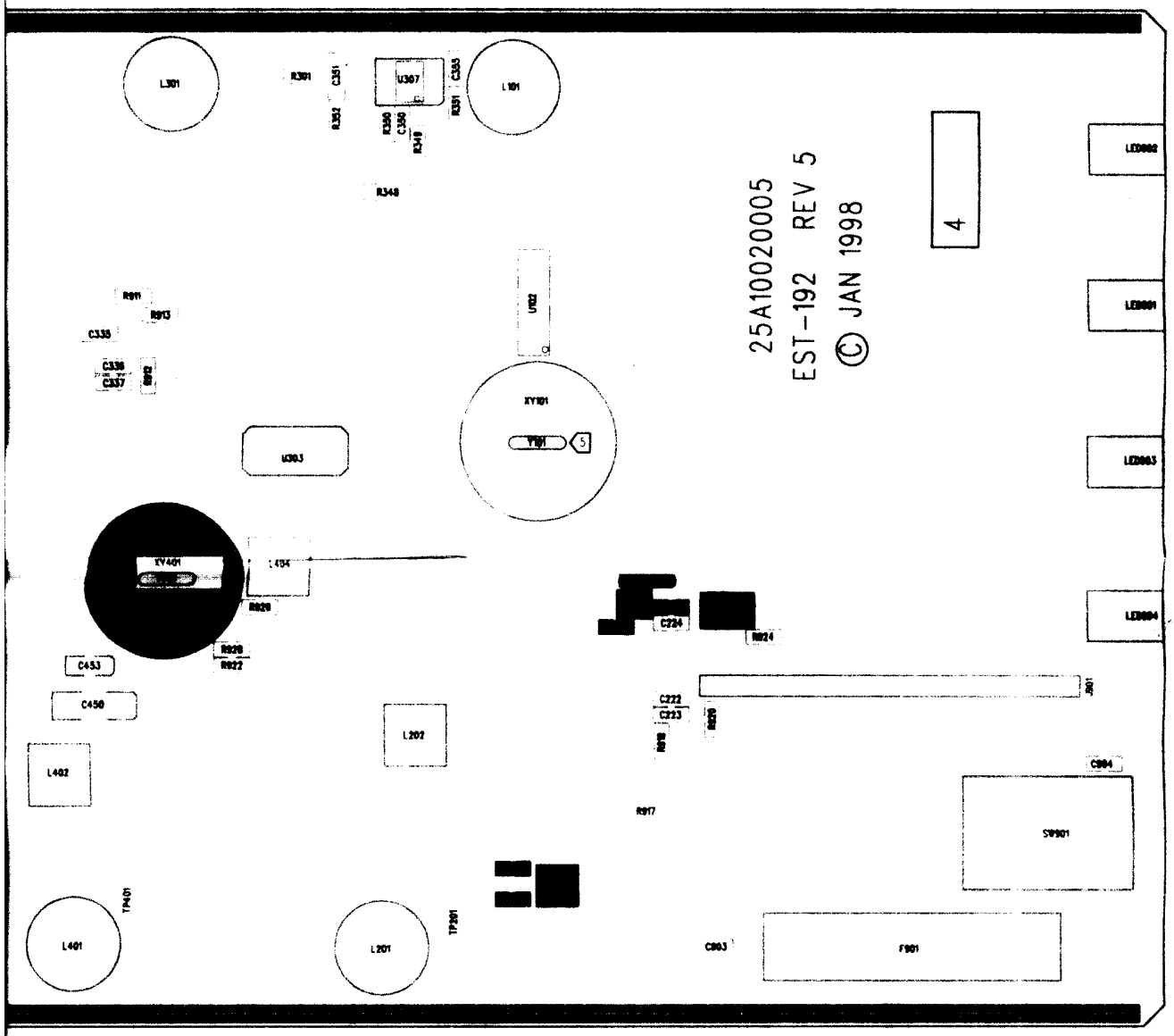
<4> APPLY THIN LAYER OF HEATSINK COMPOUND

<5> INSTALL FOAM AND MYLAR INSULATORS UNDER ALL 3 C

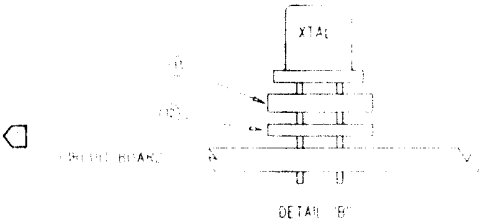
<6> L106 & L310 WILL BE INSTALLED BY EST.

3	2	1

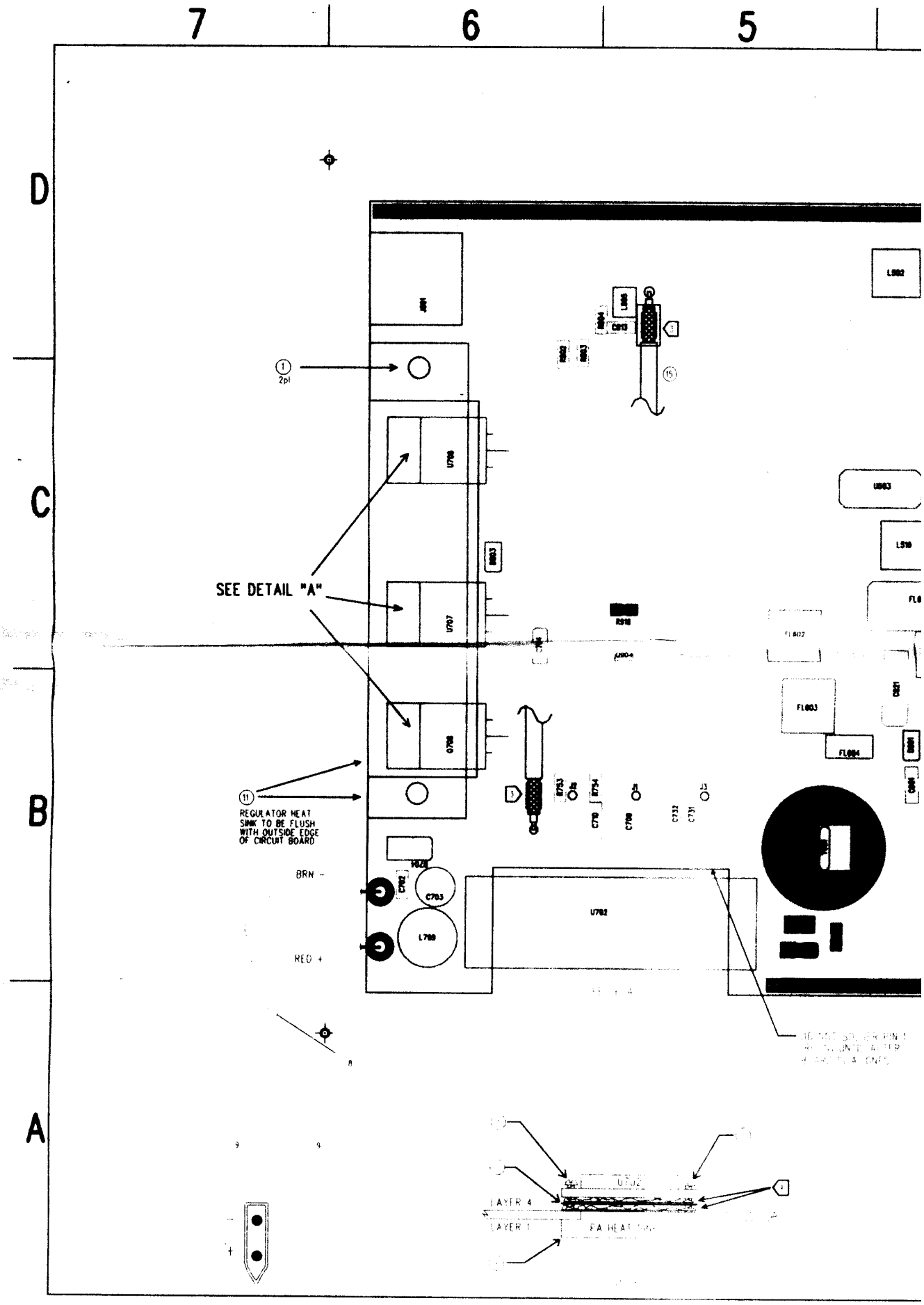
DRAWN	REV	ECO #	DESCRIPTION	CHECK	DATE



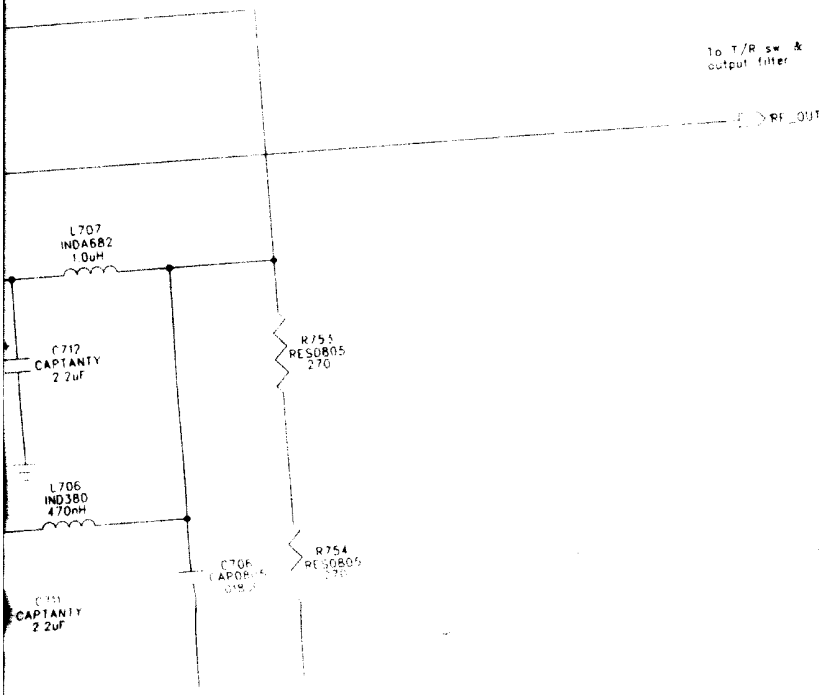
FCC ID: ENPESTEEMI92M



IDAFAB	RELEASE	ELECTRONIC SYSTEMS TECHNOLOGY	
C.CLARK			
	NEXT ASSY 80A014	SYSTEM 192M WIRELESS MODEM	
	DRG NUMBER B00407	SIZE TXRX ASSEMBLY DRAWING	
	SHEET 2 OF 2	NA / C	80B0160200A / A

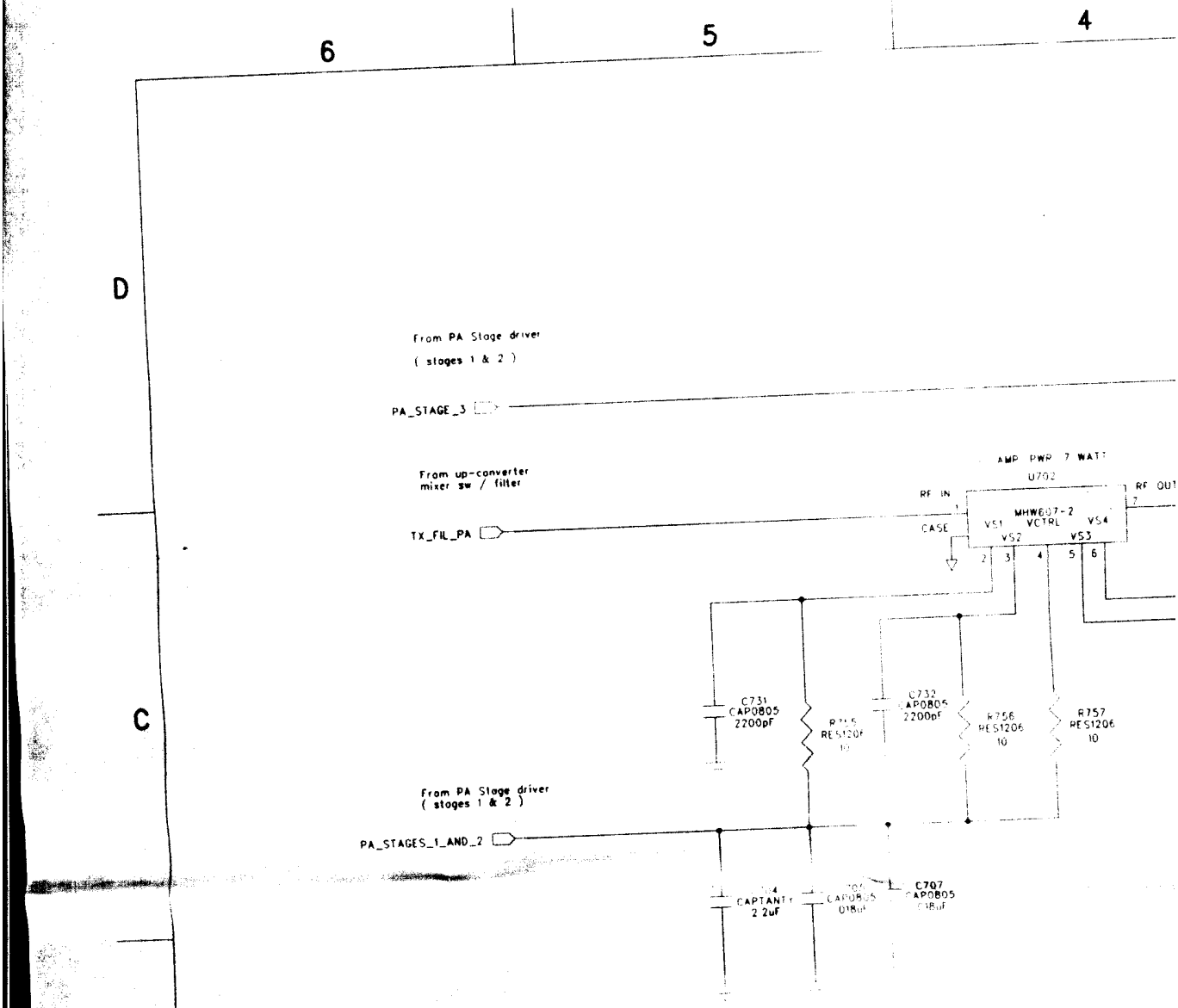

7
6
5
D
C
B
A
SEE DETAIL "A"
REGULATOR HEAT SINK TO BE FLUSH WITH OUTSIDE EDGE OF CIRCUIT BOARD
BRN -
RED +
LAYER 4
LAYER 1

DRAWN	REV	ECO #	DESCRIPTION	CHECK	DATE

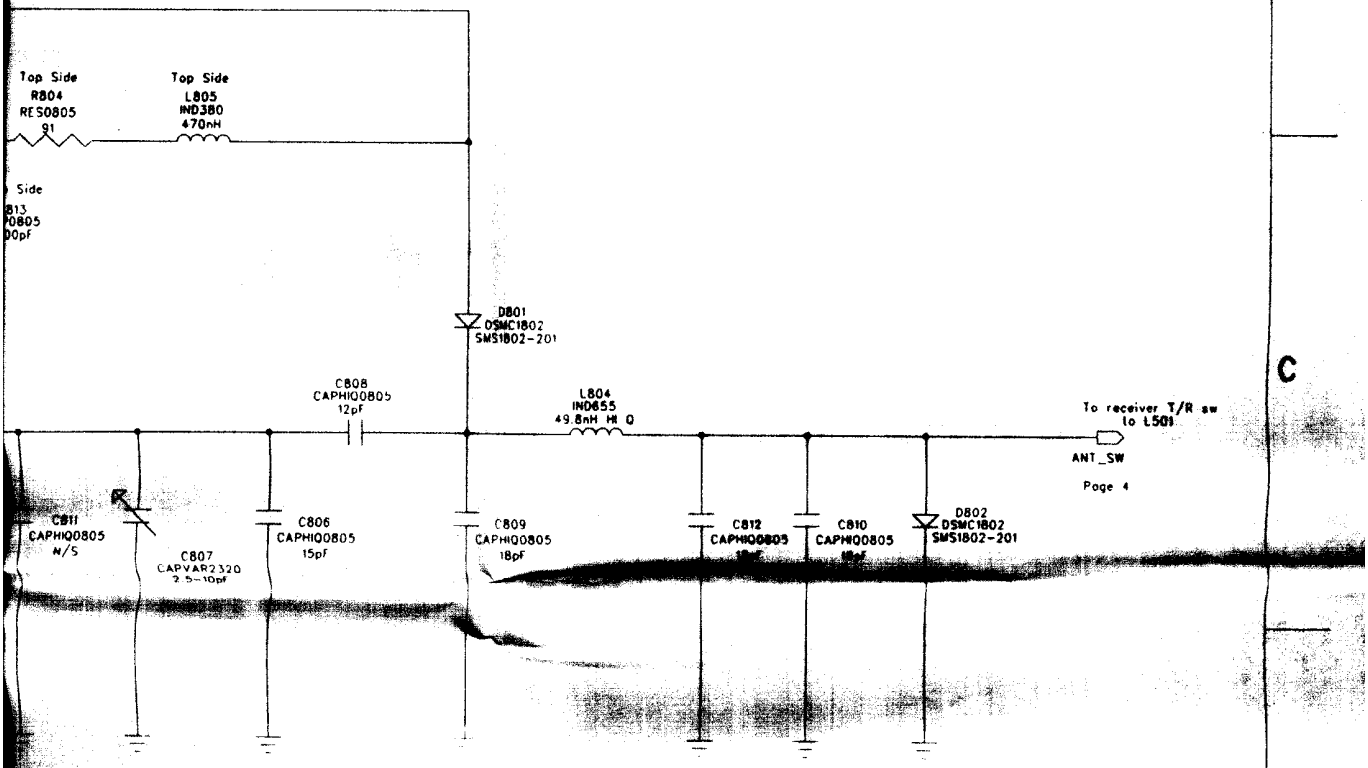


FCC ID: ENPESTEEM192M

UNSIGNED	IDAFAB ENG	RELEASE PRE: 6/97	ELECTRONIC SYSTEMS TECHNOLOGY
DRAWN	C. CLARK	PROTO X	
CHECKED	B STRECKER	QUAL X	
		PROD X	
UNLESS OTHERWISE SPECIFIED TOLERANCES: DECIMAL XX +/- .010, XXX +/- .005; FRACTIONAL +/- 1/64; ANGULAR +/- 1/2; HOLE +/- .004 .002; ALL DIMENSIONS IN INCHES DO NOT SCALE THIS DWG	NEXT ASSY 80B016	SYSTEM 192M WIRELESS MODEM	
	DWG NUMBER C00406	TITLE 192M POWER AMP	
	SHEET 9 OF 11	SCALE NA / SIZE C / PART NO 80B0160200A	REV A


6
5
4
D
C
B
A
From PA Stage driver
(stages 1 & 2)
PA_STAGE_3
From up-converter
mixer sw / filter
TX_FIL_PA
AMP PWR 7 WATT
U702
RF IN
RF OUT
MHW607-2
VCTRL
VS1
VS2
VS3
VS4
CASE
C731
CAP0805
2200pF
R756
RES1206
10
C732
CAP0805
2200pF
R757
RES1206
10
From PA Stage driver
(stages 1 & 2)
PA_STAGES_1_AND_2
C707
CAP0805

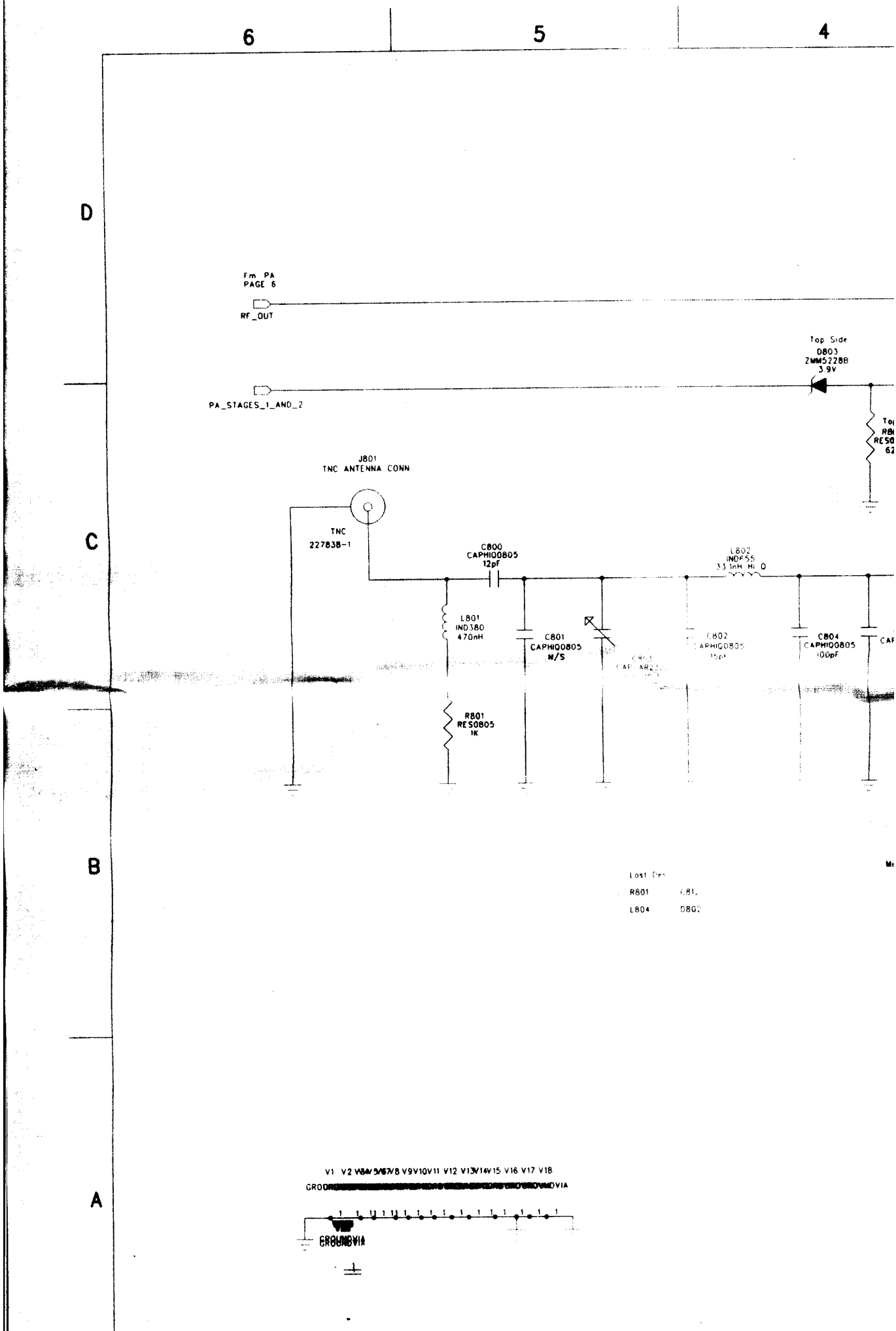
DRAWN	REV.	ECO #	DESCRIPTION	CHECK:	DATE:



Notes:

FCC ID: ENPESTEEM192M

DESIGNED 5/97 IDAFAB	RELEASE	PREL 4/97	ELECTRONIC SYSTEMS TECHNOLOGY
DRAWN 4/97 C.Clark		PROTO X	
CHECKED 4/97 D.B.Strecker		QUAL X	
UNLESS OTHERWISE SPECIFIED TOLERANCES		PROD X	
DECIMAL XX +/- .010 XXX +/- .005	NEXT ASSY 80B016	SYSTEM 192M WIRELESS MODEM	
FRACTIONAL +/- 1/64	DWG NUMBER C00406	TITLE ANT. FILTER & T/R SWITCH 800 SERIES	
ANGULAR +/- 1/2			
HOLE +/- .004 +/- .002	SHEET 10 OF 11	SCALE NA SIZE C	PART NO 80B0160200A REV A
ALL DIMENSIONS IN INCHES			


6
5
4
D
C
B
A
Fm PA
PAGE 6
RF_OUT
PA_STAGES_1_AND_2
Top Side
D803
ZMM5228B
3.9V
J801
TNC ANTENNA CONN
TNC
227838-1
C800
CAPHIO0805
12pF
L801
IND380
470nH
C801
CAPHIO0805
N/S
L802
IND455
33 1nH Hi Q
C802
CAPHIO0805
C804
CAPHIO0805
100pF
R801
RES0805
1K
Lost Dev
R801
L804
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11 V12 V13 V14 V15 V16 V17 V18
GROUNDVIA
GROUNDVIA

DRAWN	REV.	ECO #	DESCRIPTION	CHECK	DATE

R917 RES0805 220 — C619/pin 3 of U606 Page 5 — RSSI

R928 RES0805 220 — C419/pin 6 of U402 Page 3 — EXCITER_SYN_ENAB

R913 RES0805 220 — SLAVE_SYN_ENAB

R926 RES0805 220 — C420/pin 5 of U402 Page 3 — EXCITER_DATA_IN

R924 RES0805 220 — C224/pin 5 of U202 Page 2 — 1ST_LO_DATA_IN

R911 RES0805 220 — SLAVE_DATA_IN

R912 RES0805 220 — SLAVE_SYN_CLK

R922 RES0805 220 — C418/pin 7 of U402 Page 3 — EXCITER_SYN_CLK

R920 RES0805 220 — C222/pin 7 of U202 Page 2 — 1ST_LO_SYN_CLK

R918 RES0805 220 — C223/pin 6 of U202 Page 2 — 1ST_LO_SYN_ENAB

GAIN_SET_ENAB

GAIN_SET_CLK

GAIN_SET_DATA_IN

C905 CAP1206 N/S

N/S

74HC194D

to R844 Page 5 — GAIN_SET_1

to R846 Page 5 — GAIN_SET_2

to R431 Page 3 — ANALOG_TX

to R627 Page 5 — ANALOG_REC

to R648 Page 5 — COR_DET

to R708/R709 Page 6 — T/R_INPUT

to Q705/Q706 Page 6 — 9V_TRAN_SW

SHOWN IN POS 1

Reset

SW901

S901A

SW 901 CONNECTIONS

POS 1	POS 2	POS 3 (MOM)
2-3	2-3	2-1
5-6	5-4	5-4

XF901 NOT SHOWN FUSECLIP 102074

XF902 NOT SHOWN FUSECLIP 102074

+12 Volts — (H) Page 6

F901 Power FUSE 4 Amp

C903 CAP0805 .01uF

(to transceiver power)

(G) Page 6 +12-G

LED903 LTL-503-11 LED-RTANG LED RED (COR)

LED904 LTL-503-11 LED-RTANG LED RED (PWR)

R908 RES0805 10K

R909 RES1206 470

R910 RES1206 470

R907 RES0805 10K

Q903 MMBT3904 MMBT3904LT1

C904 CAP0805 .01uF

Notes:

1. C902 not installed in current version

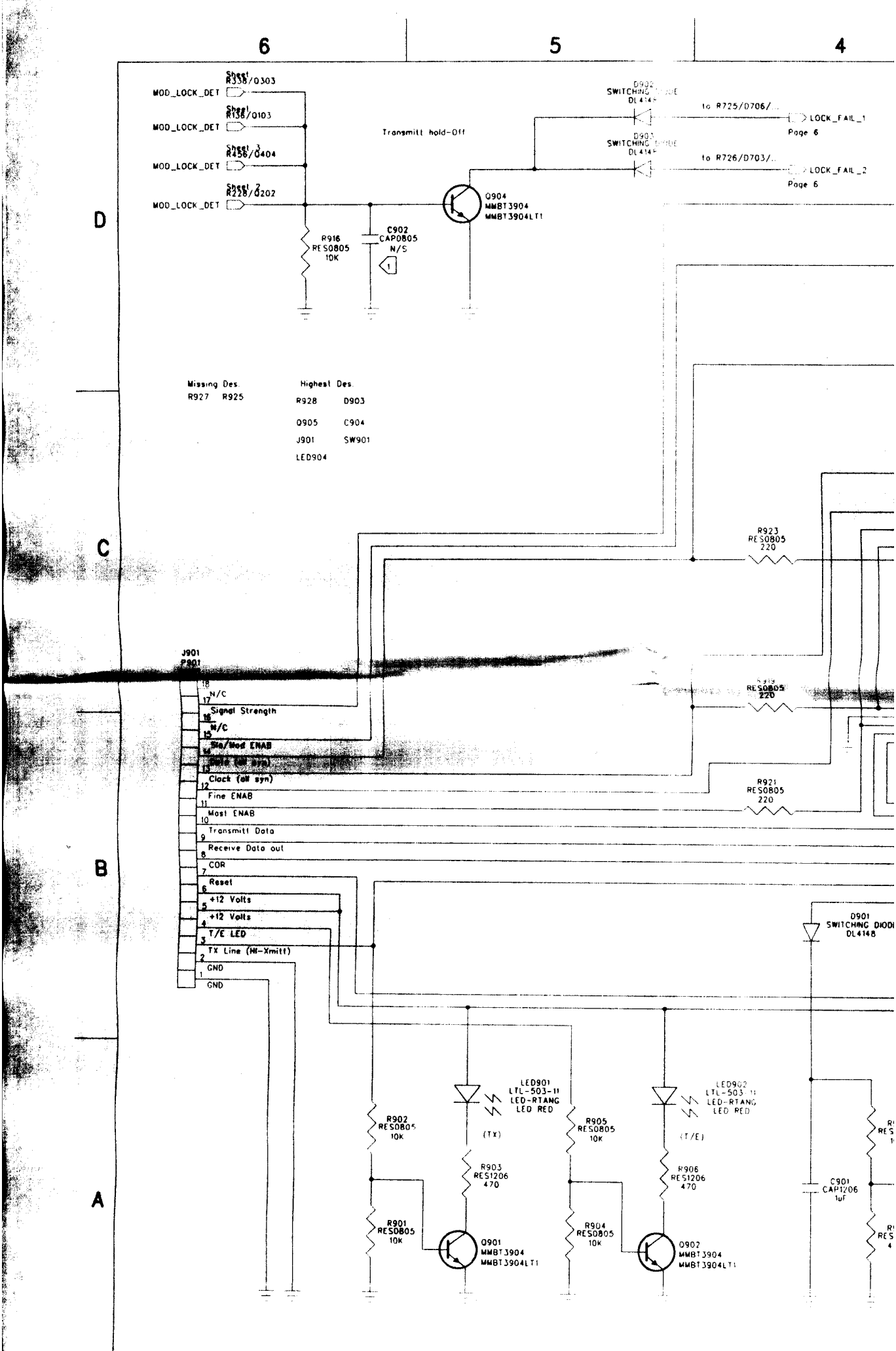
DESIGNED 3/97	IDAF AB	RELEASE	PREL 4/97
DRAWN 4/97	C.Clark		PROTO X
CHECKED 4/97	D.B.Strecker		QUAL X
UNLESS OTHERWISE SPECIFIED TOLERANCES		NEXT ASSY	PROD X
DECIMAL	XX +/- .010 XXX +/- .005	80B016	
FRACTIONAL	+/- 1/64	DWG NUMBER	
ANGULAR	+/- 1/2	C00406	
HOLE	+/- .004 +/- .002		

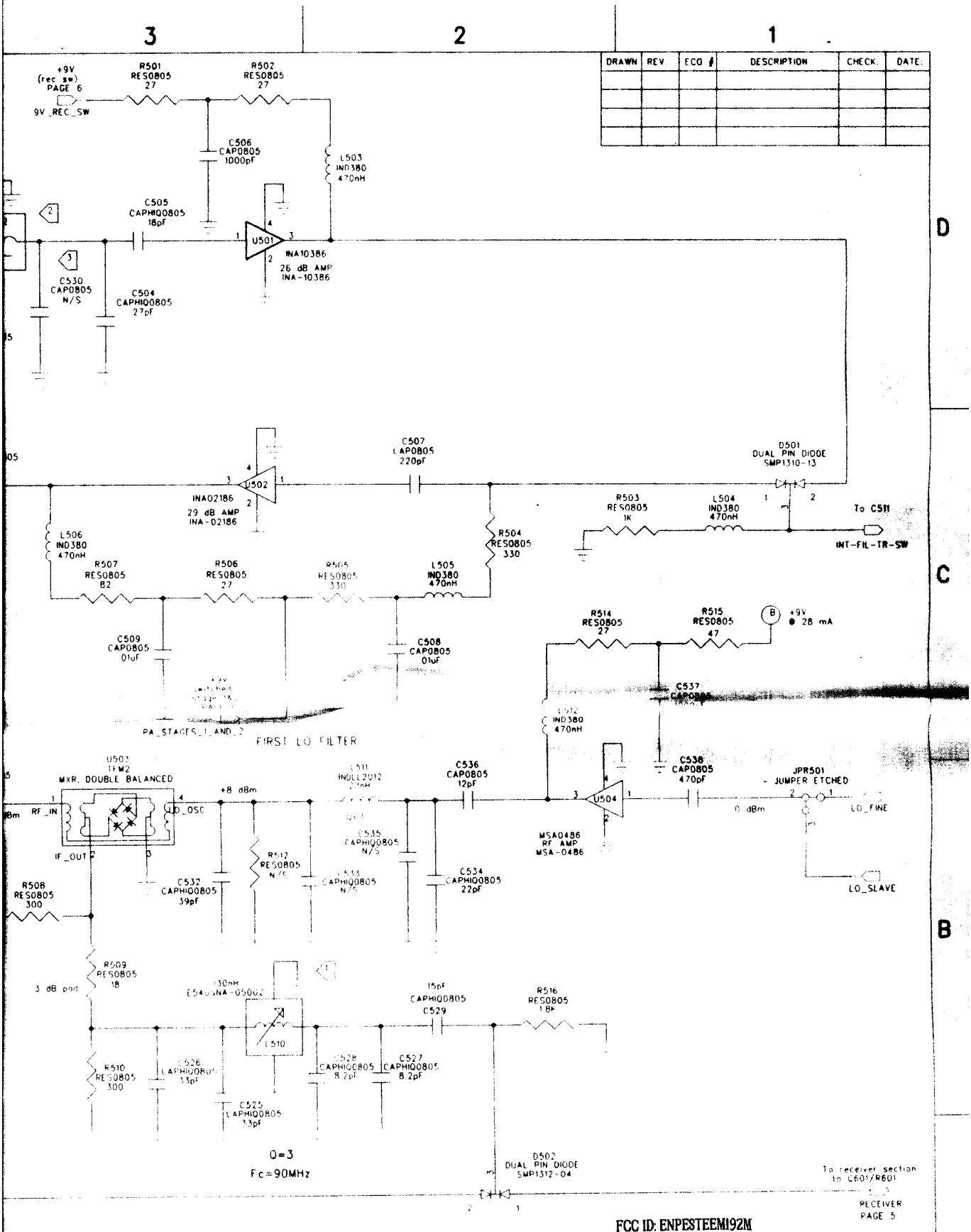
ELECTRONIC SYSTEMS TECHNOLOGY

SYSTEM: 192M WIRELESS MODEM

TITLE: MISC/GLUE LOGIC 900 SERIES

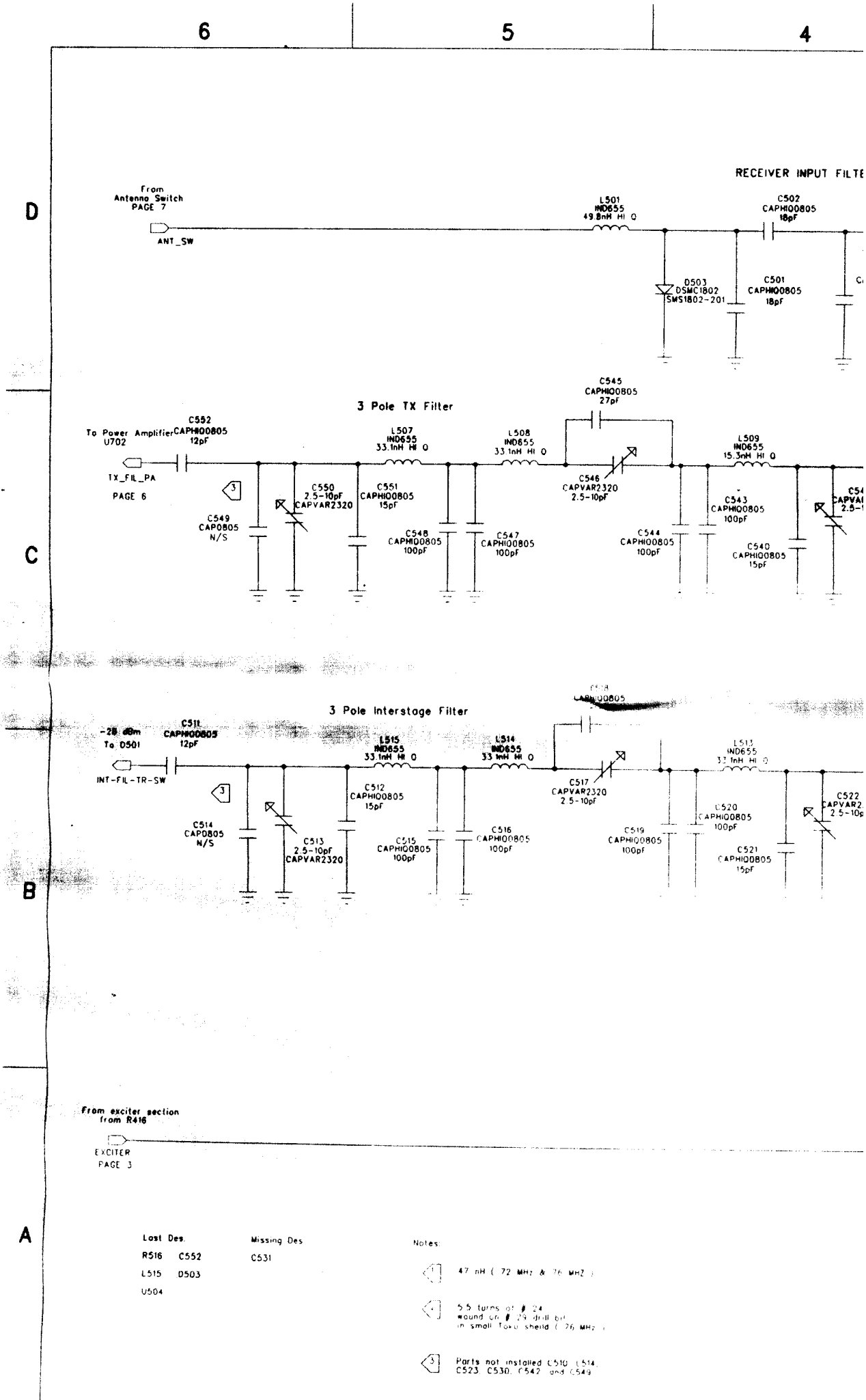
SCALE | SIZE | PART NO. | REV


6
5
4
D
C
B
A
MOD_LOCK_DET
Shasi R338/0303
Shasi R138/0103
Shasi 3 R456/0404
Shasi 2 R228/0202
Transmitt hold-Off
D902 SWITCHING DIODE DL4148
D903 SWITCHING DIODE DL4148
to R725/D706/..
LOCK_FAIL_1
Page 6
to R726/D703/..
LOCK_FAIL_2
Page 6
Q904 MMBT3904 MMBT3904LT1
R916 RES0805 10K
C902 CAP0805 N/S
Missing Des
R927 R925
Highest Des
R928 D903
D905 C904
J901 SW901
LED904
R923 RES0805 220
R921 RES0805 220
J901
P901
N/C
Signal Strength
N/C
Mic/Mod ENAB
Clock (all syn)
Fine ENAB
Mast ENAB
Transmitt Data
Receive Data out
COR
Reset
+12 Volts
+12 Volts
T/E LED
TX Line (Hi-Xmitt)
GND
GND
D901 SWITCHING DIODE DL4148
LED901 LTL-503-11 LED-RTANG LED RED
(TX)
LED902 LTL-503-11 LED-RTANG LED RED
(T/E)
R902 RES0805 10K
R903 RES1206 470
R901 RES0805 10K
Q901 MMBT3904 MMBT3904LT1
R905 RES0805 10K
R904 RES0805 10K
R906 RES1206 470
Q902 MMBT3904 MMBT3904LT1
C901 CAP1206 1uF

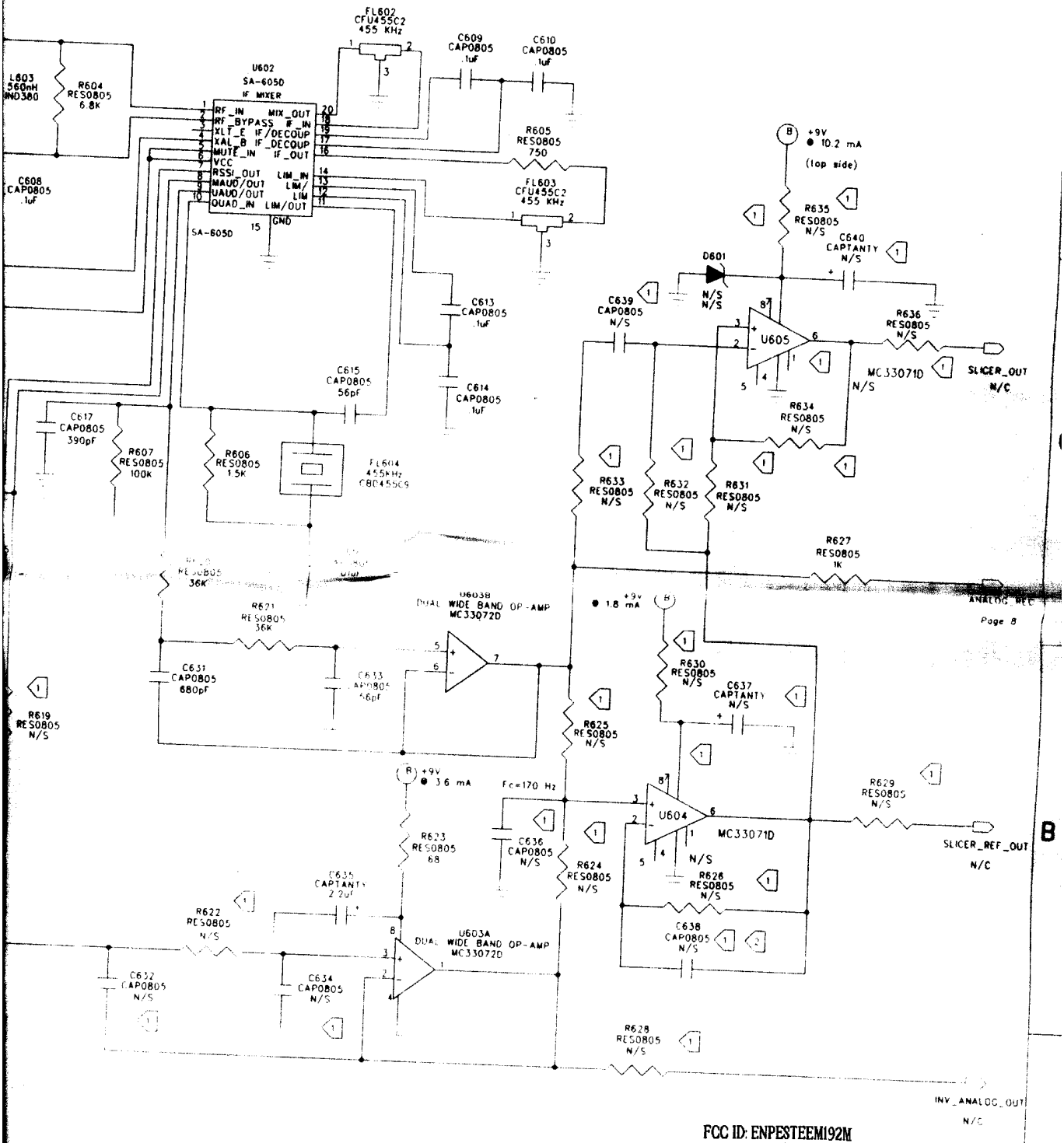


FCC ID: ENPESTEEM192M

DESIGNED 1/97 IDAFAB	RELEASE PRE 4/97	ELECTRONIC SYSTEMS TECHNOLOGY	
DRAWN 4/97 C.Clark	PROTO X		
CHECKED 4/97 D.B.Strecker	DUAL X		
UNLESS OTHERWISE SPECIFIED TOLERANCES	PROD X	NEXT ASSY 80B016	SYSTEM 192M WIRELESS MODEM
DECIMAL XX +/- .010 XXX +/- .005 FRACTIONAL +/- 1/64 ANGULAR +/- 1/2 .XXXX +/- .0004 .XXXXX +/- .00005		DWG NUMBER C00406	TITLE MAIN TRANSCEIVER 500 SERIES
		SCALE	SIZE	PART NO	QTY


6
5
4
D
C
B
A
RECEIVER INPUT FILTE
From
Antenna Switch
PAGE 7
ANT_SW
L501
IND655
49.8nH HI Q
C502
CAPHI00805
18pF
D503
DSMC1802
SMS1802-201
C501
CAPHI00805
18pF
3 Pole TX Filter
C545
CAPHI00805
27pF
To Power Amplifier
U702
C552
CAPHI00805
12pF
TX_FIL_PA
PAGE 6
L507
IND655
33.1nH HI Q
L508
IND655
33.1nH HI Q
L509
IND655
15.3nH HI Q
C549
CAP0805
N/S
C550
2.5-10pF
CAPVAR2320
C551
CAPHI00805
15pF
C548
CAPHI00805
100pF
C547
CAPHI00805
100pF
C546
CAPVAR2320
2.5-10pF
C544
CAPHI00805
100pF
C543
CAPHI00805
100pF
C540
CAPHI00805
15pF
3 Pole Interstage Filter
-28 dBm
To D501
C511
CAPHI00805
12pF
INT-FIL-TR-SW
L515
IND655
33.1nH HI Q
L514
IND655
33.1nH HI Q
L513
IND655
33.1nH HI Q
C514
CAP0805
N/S
C513
2.5-10pF
CAPVAR2320
C512
CAPHI00805
15pF
C515
CAPHI00805
100pF
C516
CAPHI00805
100pF
C517
CAPVAR2320
2.5-10pF
C519
CAPHI00805
100pF
C520
CAPHI00805
100pF
C521
CAPHI00805
15pF
From exciter section
from R416
EXCITER
PAGE 3
Last Des.
R516 C552
L515 D503
U504
Missing Des
C531
Notes:
1 47 nH (72 MHz & 76 MHz)
2 5.5 turns of # 24
wound on # 29 drill bit
in small Toko shield (76 MHz)
3 Parts not installed C510, L514,
C523, C530, C542 and C549

DRAWN	REV.	ECO #	DESCRIPTION	CHECK:	DATE

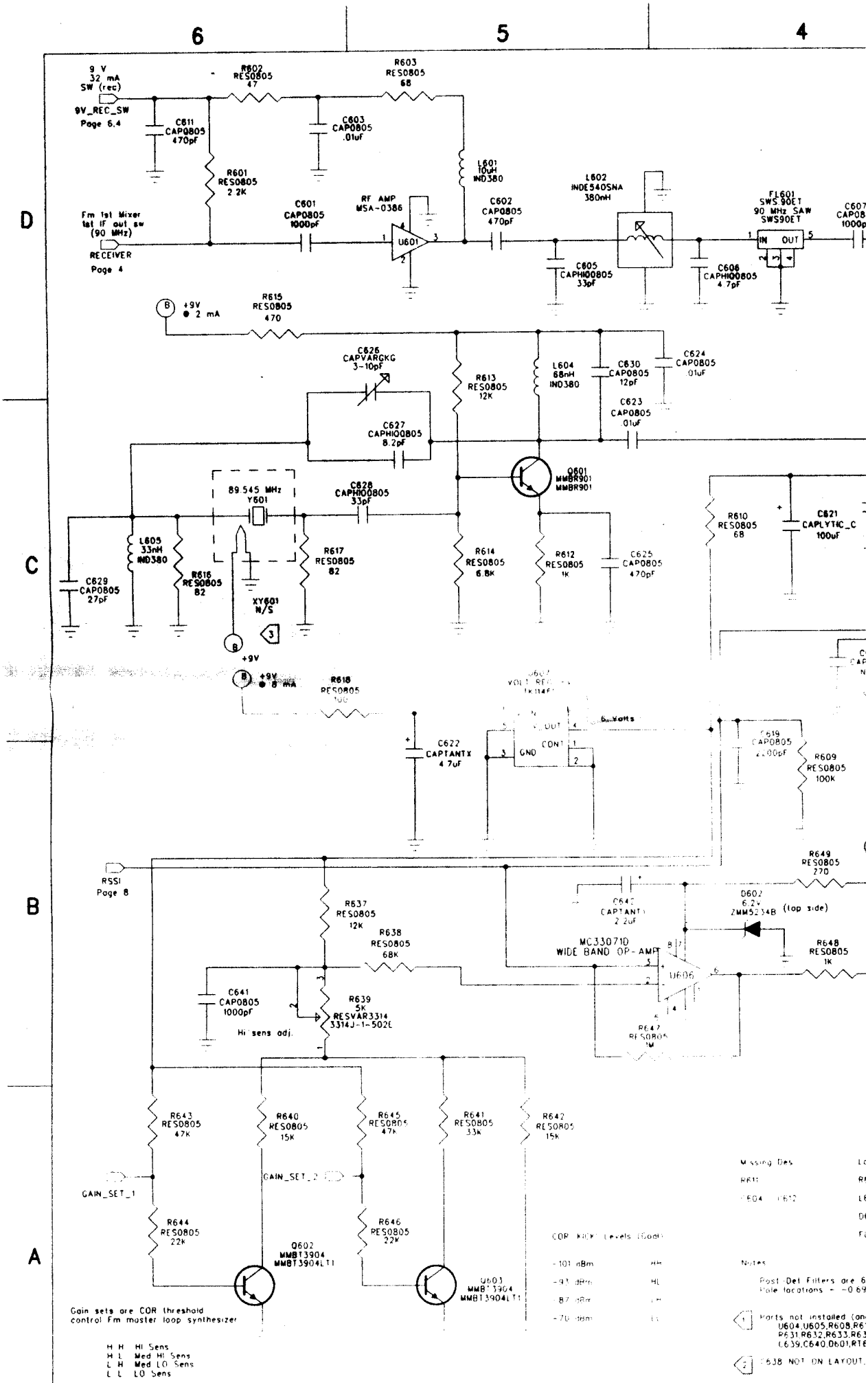


FCC ID: ENPESTEEM192M

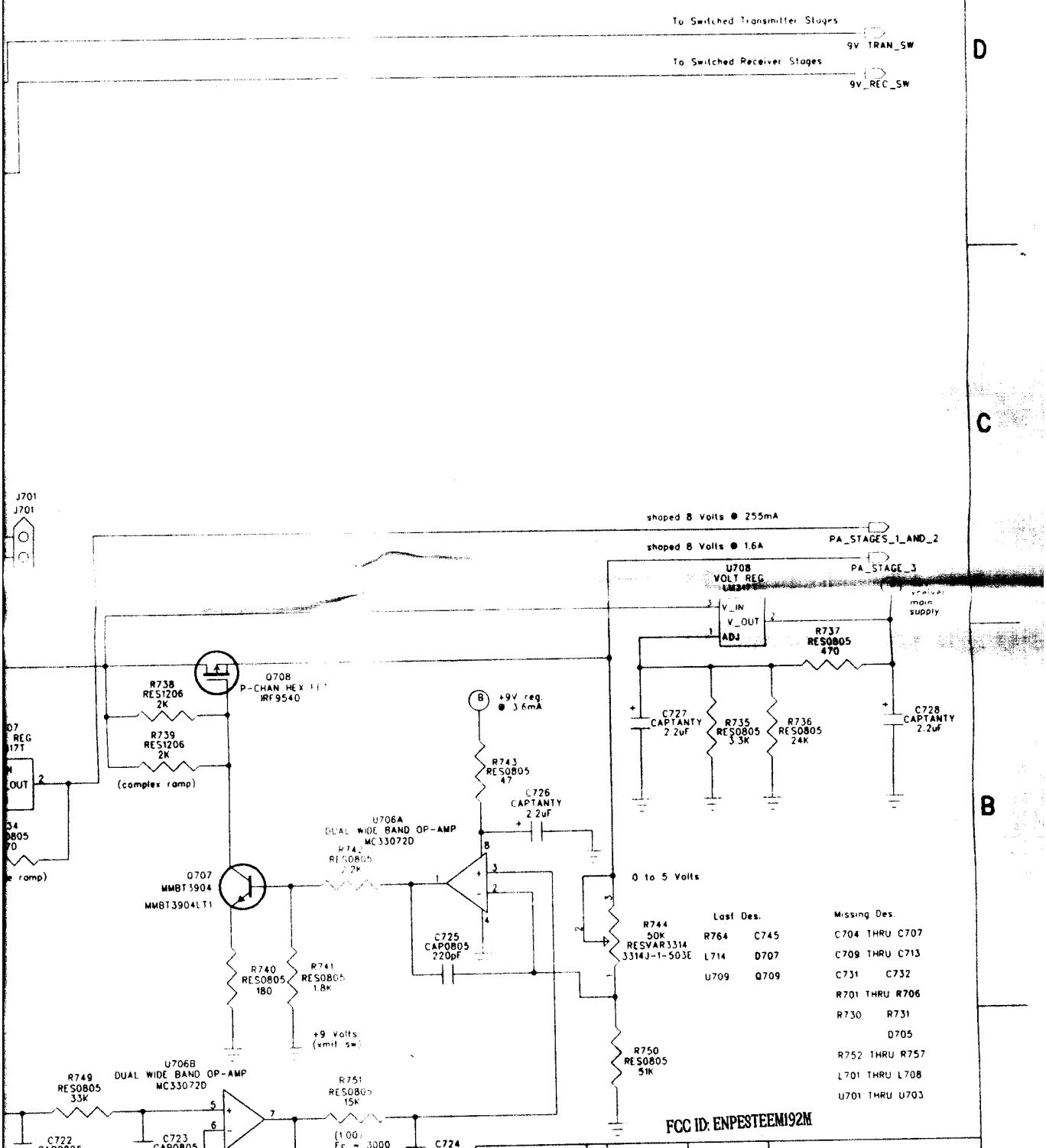
DESIGNED 1/97 IDAFAB	RELEASE PRE: 4/97	ESTL	ELECTRONIC SYSTEMS TECHNOLOGY
DRAWN 4/97 C.Clark	PROTO: X		
CHECKED 4/97 D.B.Strecker	DUAL: X		
UNLESS OTHERWISE SPECIFIED TOLERANCES: DECIMAL .XX +/- .01, .XXX +/- .005; FRACTIONAL +/- 1/64; ANGULAR +/- 1/2; HOLE +/- .004, +/- .002	PROD: X	NEXT ASSY 80B016	SYSTEM 192M WIRELESS MODEM
		DWG NUMBER C00406	TITLE RECEIVER 600 SERIES

deg.) L-P-Filters

,R628,R629,R630
.C636,C637,C638


6
5
4
D
C
B
A
9 V
32 mA
SW (rec)
9V_REC_SW
Page 6.4
R602
RES0805
47
R603
RES0805
68
C611
CAP0805
470pF
C603
CAP0805
.01uF
R601
RES0805
2.2K
L601
10uH
IND380
L602
INDE540SNA
380nH
FL601
SWS 90ET
90 MHz SAW
SWS90ET
C607
CAP08
1000p
Fm 1st Mixer
1st IF out sw
(90 MHz)
RECEIVER
Page 4
C601
CAP0805
1000pF
RF AMP
MSA-0386
U601
C602
CAP0805
470pF
C605
CAPHI00805
33pF
C606
CAPHI00805
4.7pF
IN
OUT
+9V
2 mA
R615
RES0805
470
C626
CAPVARGKG
3-10pF
R613
RES0805
12K
L604
68nH
IND380
C630
CAP0805
12pF
C624
CAP0805
.01uF
C623
CAP0805
.01uF
C627
CAPHI00805
8.2pF
Q601
MMBR901
MMBR901
89.545 MHz
Y601
C628
CAPHI00805
33pF
R610
RES0805
68
C621
CAPLYTIC_C
100uF
L605
33nH
IND380
R616
RES0805
82
R617
RES0805
82
R614
RES0805
6.8K
R612
RES0805
1K
C625
CAP0805
470pF
C629
CAP0805
27pF
XY601
N/S
+9V
+9V
8 mA
R618
RES0805
100
C622
CAPTANTX
4.7uF
GND
CONT
6 Volts
C619
CAP0805
2.00pF
R609
RES0805
100K
RSSI
Page 8
R649
RES0805
270
C640
CAPTANTX
2.2uF
D602
6.2v
ZMM5234B
(top side)
R637
RES0805
12K
R638
RES0805
68K
MC33071D
WIDE BAND OP-AMP
U606
R648
RES0805
1K
C641
CAP0805
1000pf
R639
5K
RESVAR3314
3314J-1-502E
Hi sens adj.
R647
RES0805
1M
R643
RES0805
47K
R640
RES0805
15K
R645
RES0805
47K
R641
RES0805
33K
R642
RES0805
15K
GAIN_SET_1
GAIN_SET_2
R644
RES0805
22K
R646
RES0805
22K
Q602
MMBT3904
MMBT3904LT1
Q603
MMBT3904
MMBT3904LT1
Gain sets are COR threshold
control Fm master loop synthesizer
H H Hi Sens
H L Med Hi Sens
L H Med LO Sens
L L LO Sens
COR ROM Levels (Goal)
-101 dBm
-93 dBm
-87 dBm
-79 dBm
Missing Des
Notes
Post-Det Filters are 6
Pole locations = -0.69
Parts not installed (on
U604,U605,R608,R6
R631,R632,R633,R63
C639,C640,D601,RTE
1638 NOT ON LAYOUT.

DRAWN	REV.	ECO #	DESCRIPTION	CHECK	DATE



Last Des.	
R764	C745
L714	D707
U709	Q709

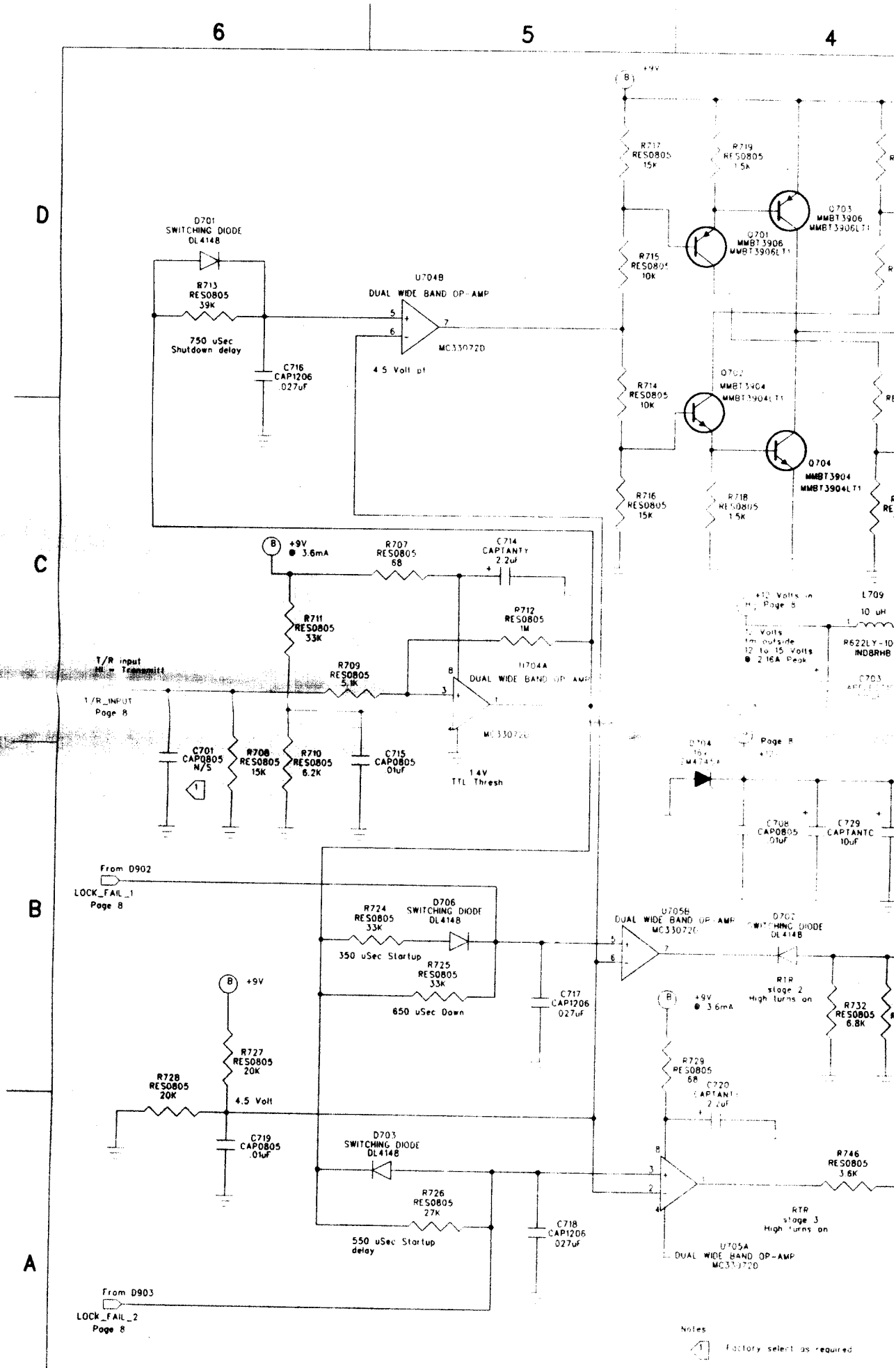
Missing Des.
C704 THRU C707
C709 THRU C713
C731 C732
R701 THRU R706
R730 R731
D705
R752 THRU R757
L701 THRU L708
U701 THRU U703

FCC ID: ENPESTEEM192M

DESIGNED 3/97	DAFAB	ELECTRONIC SYSTEMS TECHNOLOGY
DRAWN 4/97	C.Clark	
CHECKED 4/97	D.B.Strecker	
RELEASE	PREL 4/97	
	PROTO X	
	QUAL X	
	PROD X	
NEXT ASSY	80A016	SYSTEM 192M WIRELESS MODEM
DWG NUMBER	C00406	TITLE T/R SEQUENCER, PWR AMP 700 SERIES

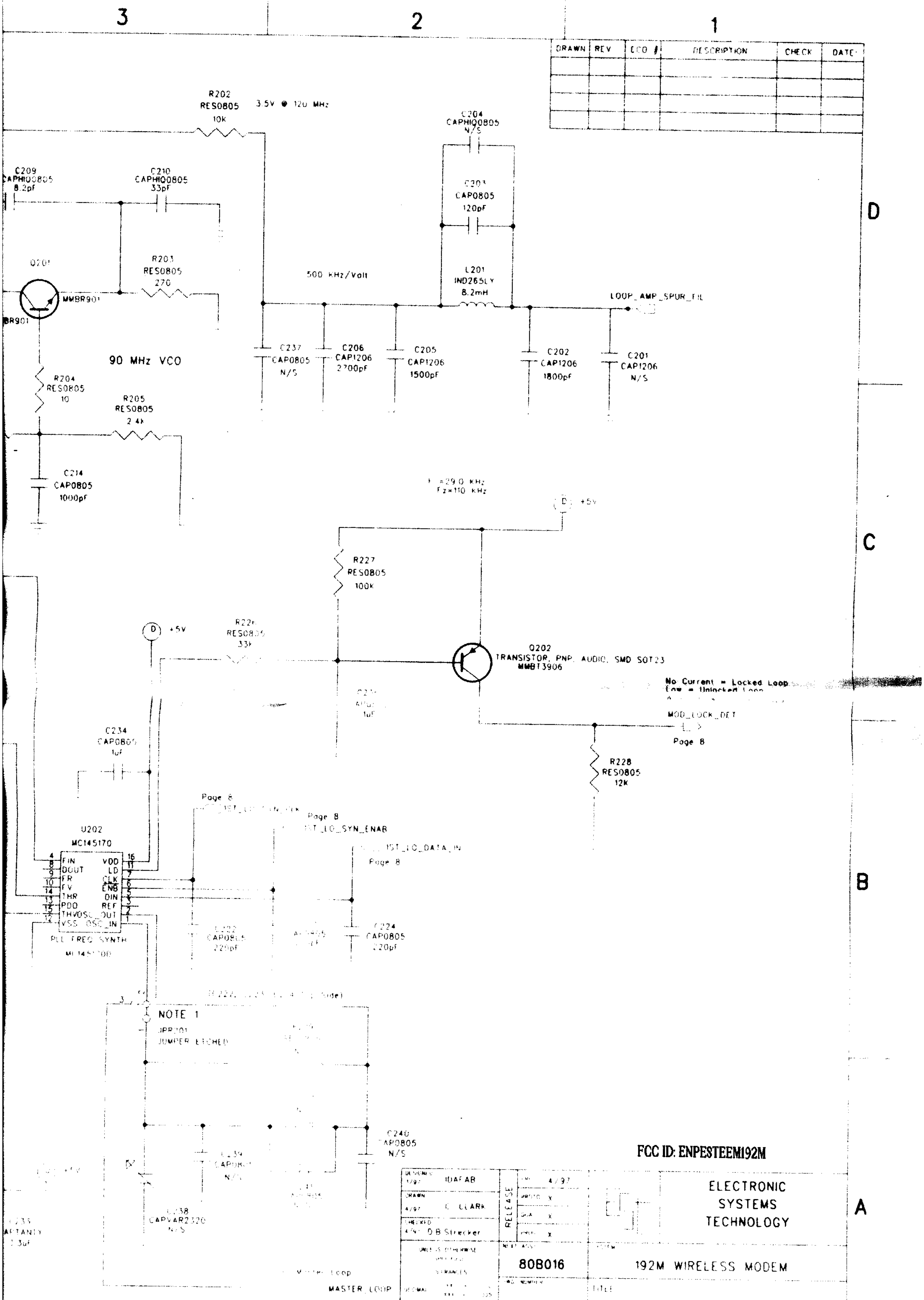
UNLESS OTHERWISE SPECIFIED
TOLERANCES
DECIMAL XX +/- .010 XXX +/- .005
FRACTIONAL +/- 1/64
ANGULAR +/- 1/2

3 2 1 D C B A



Transmit Power Sequencer

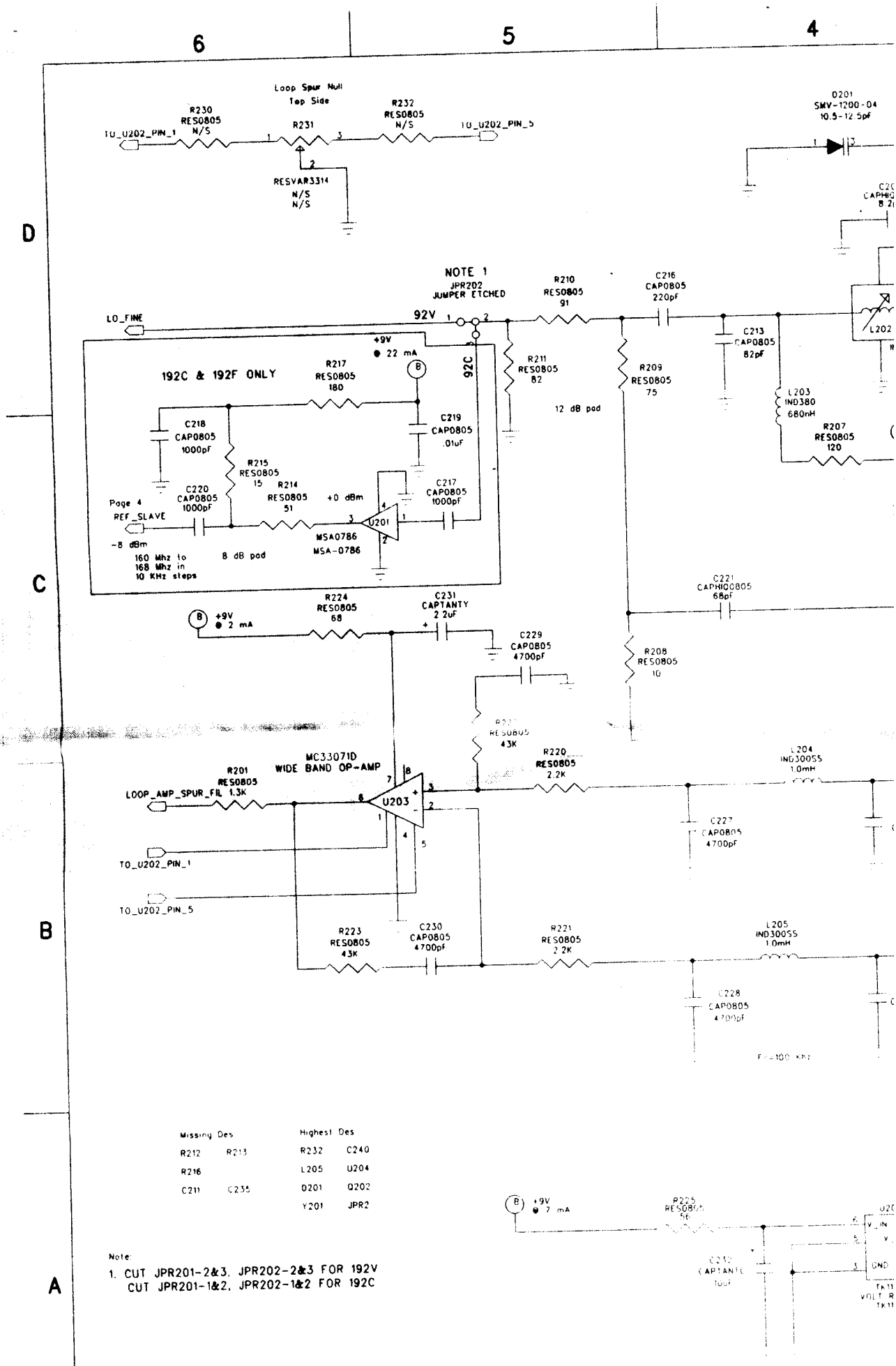
DRAWN	REV	ECO #	DESCRIPTION	CHECK	DATE



3
2
1
D
C
B
A
R202
RES0805
10k
3.5V @ 120 MHz
C204
CAPHIQ0805
N/S
C209
CAPHIQ0805
8.2pF
C210
CAPHIQ0805
33pF
C203
CAP0805
120pF
R203
RES0805
270
Q201
MMBR901
500 KHz/Volt
L201
IND265LY
8.2mH
LOOP_AMP_SPUR_FIL
90 MHz VCO
C237
CAP0805
N/S
C206
CAP1206
2700pF
C205
CAP1206
1500pF
C202
CAP1206
1800pF
C201
CAP1206
N/S
R204
RES0805
10
R205
RES0805
2.4k
C214
CAP0805
1000pF
Fz=110 KHz
+5V
R227
RES0805
100k
R226
RES0805
33k
Q202
TRANSISTOR, PNP, AUDIO, SMD SOT23
MMBT3906
No Current = Locked Loop
Low = Unlocked Loop
MOD_LOCK_DET
Page 8
R228
RES0805
12k
C234
CAP0805
1uF
Page 8
Page 8
1ST_LO_SYN_ENAB
1ST_LO_DATA_IN
Page 8
U202
MC145170
FIN
DOUT
FR
FV
THR
PDO
THVOSC_OUT
VSS OSC_IN
VDD
LD
CLK
ENB
DIN
REF
PLL FREQ SYNTH
C222
CAP0805
220pF
C224
CAP0805
220pF
NOTE 1
JPR201
JUMPER ETCHED
C240
CAP0805
N/S
C239
CAP0805
N/S
C238
CAPVAR2320
N/S
MASTER_LOOP

FCC ID: ENPESTEEM192M

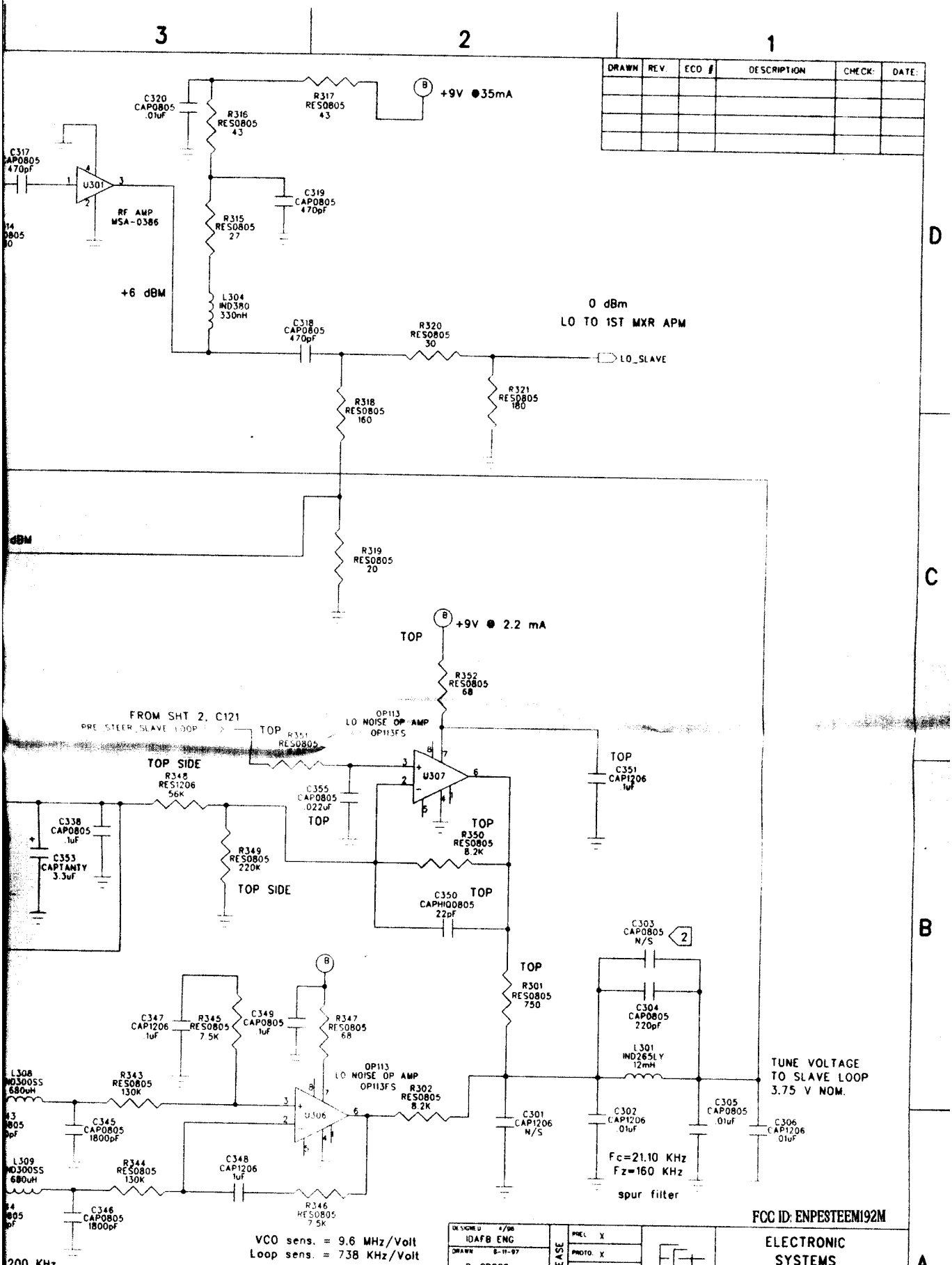
DESIGNED 4/97 IDAFAB	RELEASE 4/97	ELECTRONIC SYSTEMS TECHNOLOGY
DRAWN 4/97 C. CLARK		
CHECKED 4/97 D.B. Strecker		
NEXT ASSY 80B016		192M WIRELESS MODEM
DWG NUMBER C00406	TITLE	TRANSCEIVER FINE LOOP 200 SERIES
SHEET 3 OF 11	SCALE NA	SIZE C
PART NO. 80B0160200A		REV A

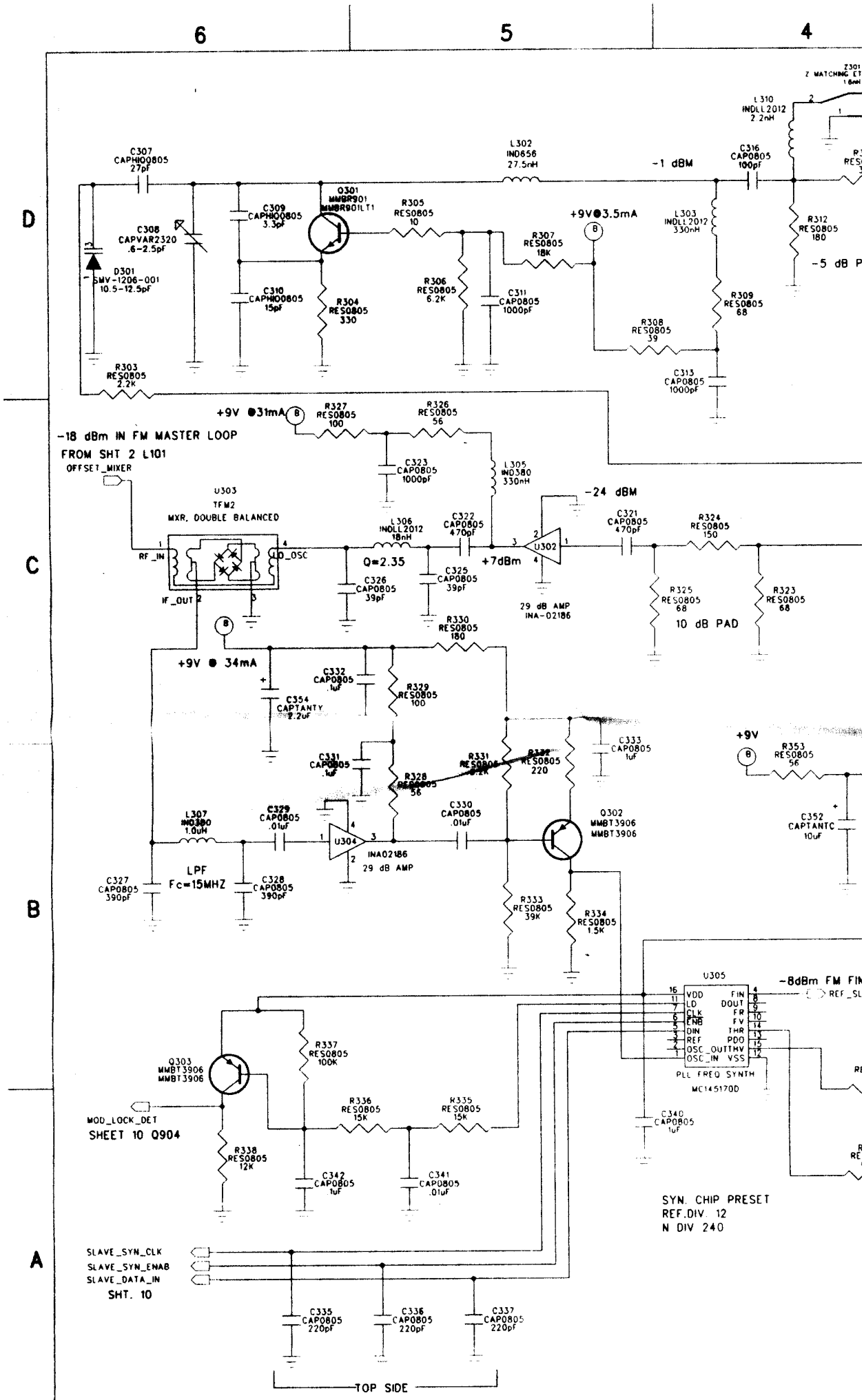


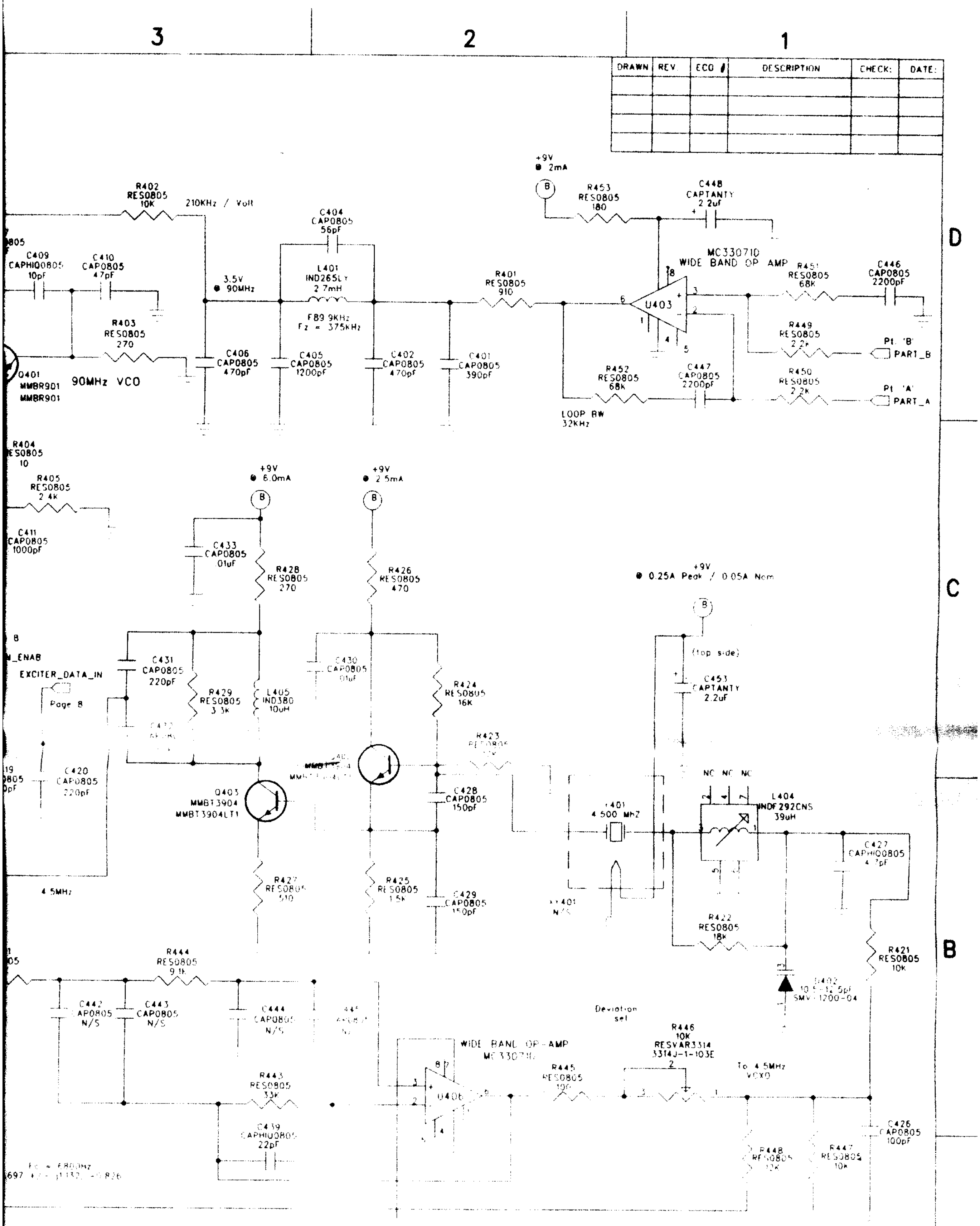
Missing Des		Highest Des	
R212	R213	R232	C240
R216		L205	U204
C211	C235	D201	Q202
		Y201	JPR2

Note:

1. CUT JPR201-2&3, JPR202-2&3 FOR 192V
   CUT JPR201-1&2, JPR202-1&2 FOR 192C


3
2
1
D
C
B
A
DRAWN
REV.
ECO #
DESCRIPTION
CHECK:
DATE:
C320 CAP0805 .01uF
R316 RES0805 43
R317 RES0805 43
+9V @35mA
C317 CAP0805 470pF
U301
RF AMP MSA-0386
C319 CAP0805 470pF
R315 RES0805 27
+6 dBM
L304 IND380 330nH
C318 CAP0805 470pF
R320 RES0805 30
0 dBm
LO TO 1ST MXR APM
LO_SLAVE
R318 RES0805 160
R321 RES0805 180
dBM
R319 RES0805 20
+9V @ 2.2 mA
TOP
R352 RES0805 68
FROM SHT 2, C121
PRE STEER SLAVE LOOP
R351 RES0805
OP113 LO NOISE OP AMP OP113FS
U307
TOP SIDE
R348 RES1206 56K
C355 CAP0805 .022uF
C351 CAP1206 1uF
C338 CAP0805 .1uF
C353 CAPTANTY 3.3uF
R349 RES0805 220K
R350 RES0805 8.2K
C350 CAPHIQ0805 22pF
C303 CAP0805 N/S
2
R301 RES0805 750
C304 CAP0805 220pF
L301 IND265LY 12mH
TUNE VOLTAGE TO SLAVE LOOP 3.75 V NOM.
C347 CAP1206 1uF
R345 RES0805 7.5K
C349 CAP0805 1uF
R347 RES0805 68
L308 IND300SS 680uH
R343 RES0805 130K
OP113 LO NOISE OP AMP OP113FS
U306
R302 RES0805 8.2K
C345 CAP0805 1800pF
C301 CAP1206 N/S
C302 CAP1206 .01uF
C305 CAP0805 .01uF
C306 CAP1206 01uF
L309 IND300SS 680uH
R344 RES0805 130K
C348 CAP1206 1uF
R346 RES0805 7.5K
C346 CAP0805 1800pF
Fc=21.10 KHz
Fz=160 KHz
spur filter
200 KHz
pprox. 18 KHz
VCO sens. = 9.6 MHz/Volt
Loop sens. = 738 KHz/Volt
FCC ID: ENPESTEEM192M
DESIGNED 4/96
IDAFB ENG
DRAWN 8-11-97
D. CROSS
CHECKED 6-12-97
B. STRECKER
UNLESS OTHERWISE SPECIFIED TOLERANCES
DECIMAL .XX +/- .010 .XXX +/- .005
FRACTIONAL +/- 1/64
ANGULAR +/- 1/2
HOLE +/- .004 +/- .002
RELEASE
PREL X
PROTO. X
QUAL X
PROD X
ELECTRONIC SYSTEMS TECHNOLOGY
NEXT ASSY
808016
SYSTEM
192M WIRELESS MODEM
162 MHZ
DWG NUMBER
C00406
TITLE
SLAVE SYNTHESIZER
300 SERIES

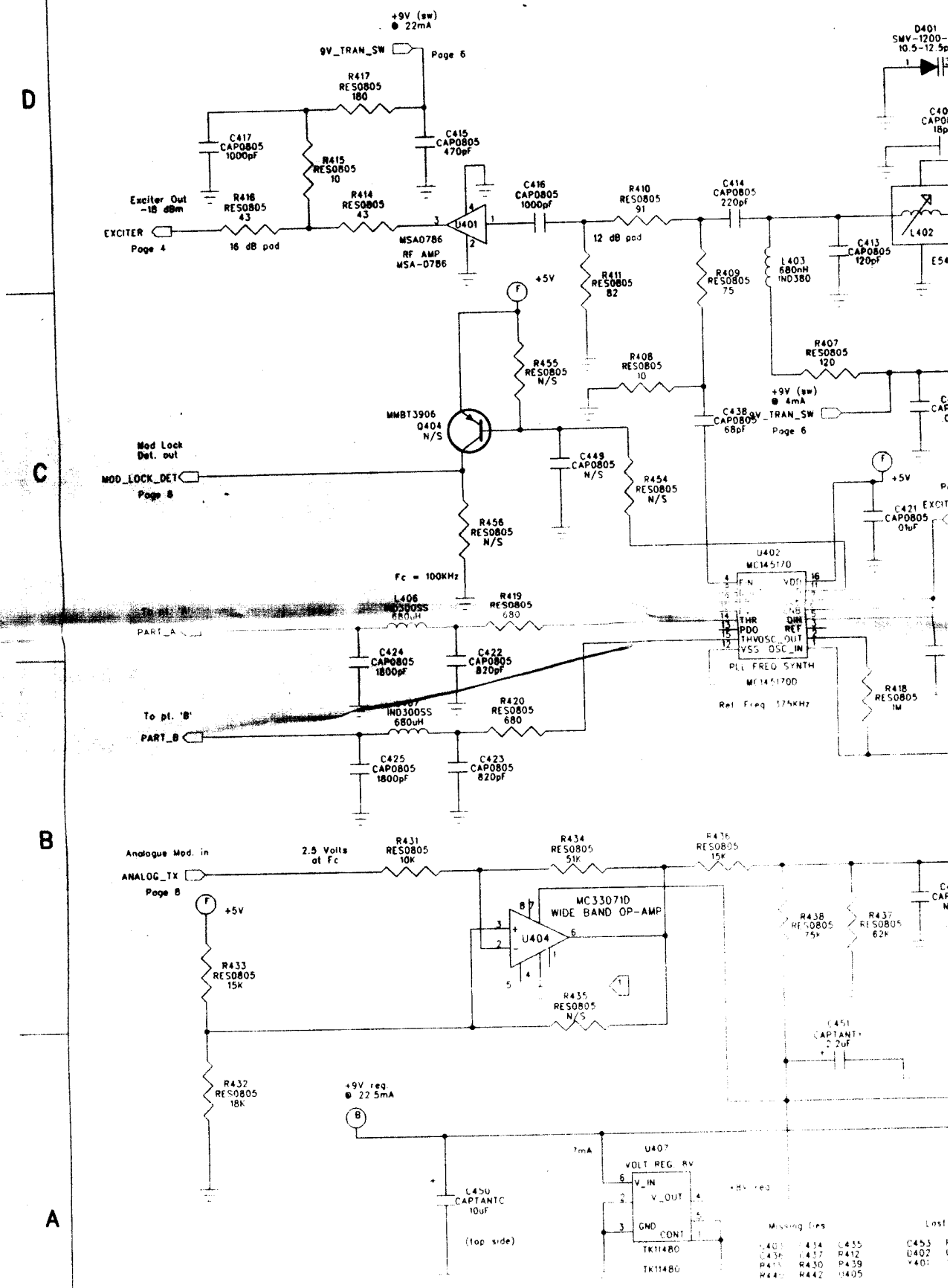

6
5
4
D
C
B
A
C307 CAPHI00805 27pF
C308 CAPVAR2320 .6-2.5pF
D301 SMV-1206-001 10.5-12.5pF
C309 CAPHI00805 3.3pF
C310 CAPHI00805 15pF
Q301 MMBR901 MMBR901LT1
R303 RES0805 2.2K
R304 RES0805 330
R305 RES0805 10
R306 RES0805 6.2K
R307 RES0805 18K
C311 CAP0805 1000pF
L302 IND656 27.5nH
-1 dBM
+9V●3.5mA
L303 INDLL2012 330nH
R308 RES0805 39
R309 RES0805 68
C313 CAP0805 1000pF
C316 CAP0805 100pF
L310 INDLL2012 2.2nH
R312 RES0805 180
-5 dB P
-18 dBm IN FM MASTER LOOP
FROM SHT 2 L101
OFFSET_MIXER
+9V ●31mA
R327 RES0805 100
R326 RES0805 56
C323 CAP0805 1000pF
L305 IND380 330nH
U303
TFM2
MXR, DOUBLE BALANCED
RF_IN
LO_OSC
IF_OUT
L306 INDLL2012 18nH
Q=2.35
C326 CAP0805 39pF
C322 CAP0805 470pF
C325 CAP0805 39pF
R330 RES0805 180
-24 dBM
+7dBm
U302
29 dB AMP
INA-02186
C321 CAP0805 470pF
R324 RES0805 150
R325 RES0805 68
R323 RES0805 68
10 dB PAD
+9V ● 34mA
C354 CAPTANTY 2.2uF
C332 CAP0805 .1uF
R329 RES0805 100
C331 CAP0805 .1uF
R328 RES0805 56
R331 RES0805 2.2K
R332 RES0805 220
C333 CAP0805 1uF
+9V
R353 RES0805 56
C352 CAPTANTC 10uF
L307 IND380 1.0uH
C329 CAP0805 .01uF
U304
INA02186
29 dB AMP
C330 CAP0805 .01uF
Q302 MMBT3906 MMBT3906
LPF
Fc=15MHZ
C327 CAP0805 390pF
C328 CAP0805 390pF
R333 RES0805 39K
R334 RES0805 1.5K
U305
-8dBm FM FIN
REF_SL
VDD
LD
CLK
ENB
DIN
REF
OSC_OUT
OSC_IN
FIN
DOUT
FR
FV
THR
PDO
THV
VSS
PLL FREQ SYNTH
MC145170D
C340 CAP0805 1uF
Q303 MMBT3906 MMBT3906
R337 RES0805 100K
MOD_LOCK_DET
SHEET 10 Q904
R336 RES0805 15K
R335 RES0805 15K
R338 RES0805 12K
C342 CAP0805 1uF
C341 CAP0805 .01uF
SYN. CHIP PRESET
REF.DIV. 12
N DIV 240
SLAVE_SYN_CLK
SLAVE_SYN_ENAB
SLAVE_DATA_IN
SHT. 10
C335 CAP0805 220pF
C336 CAP0805 220pF
C337 CAP0805 220pF
TOP SIDE

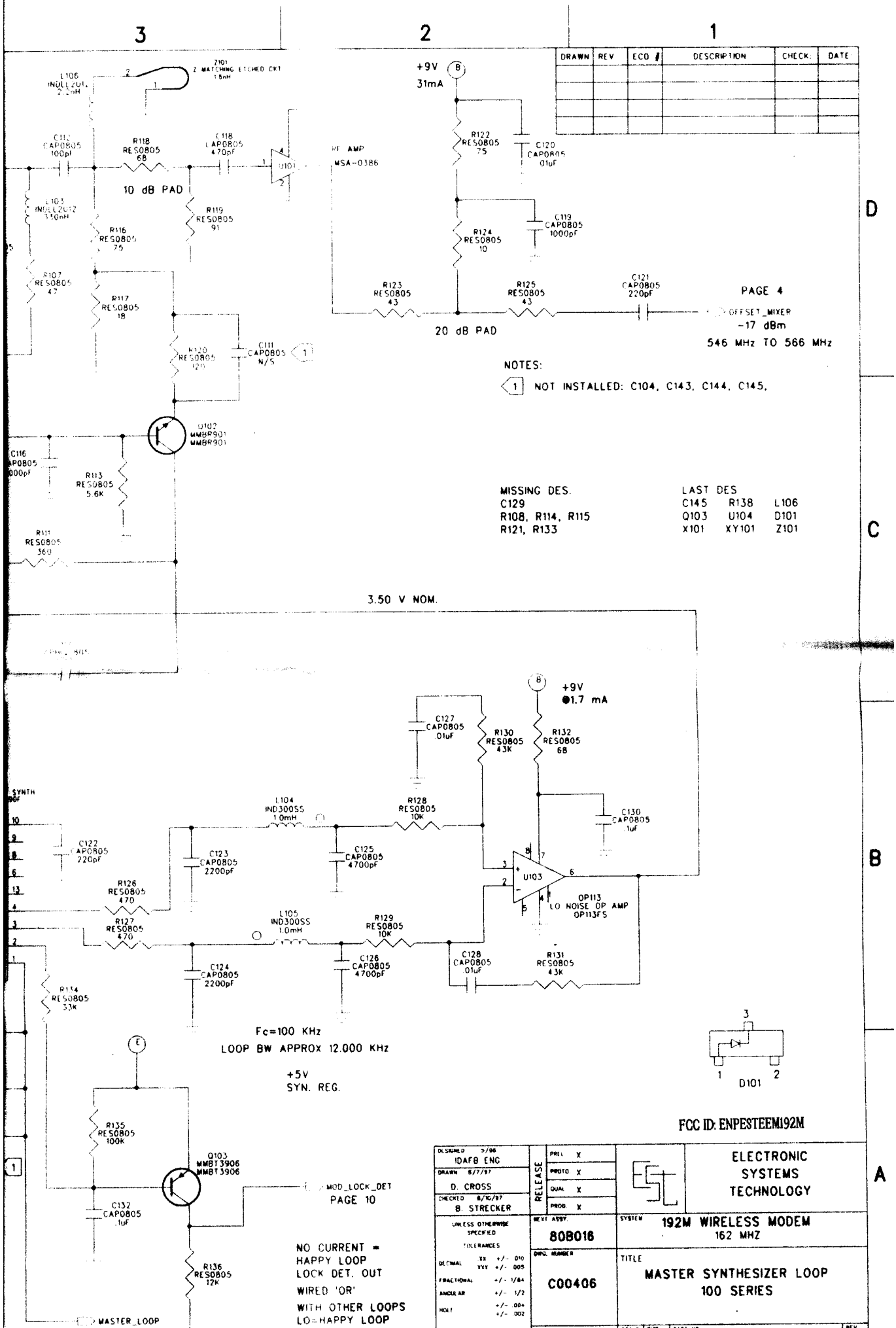


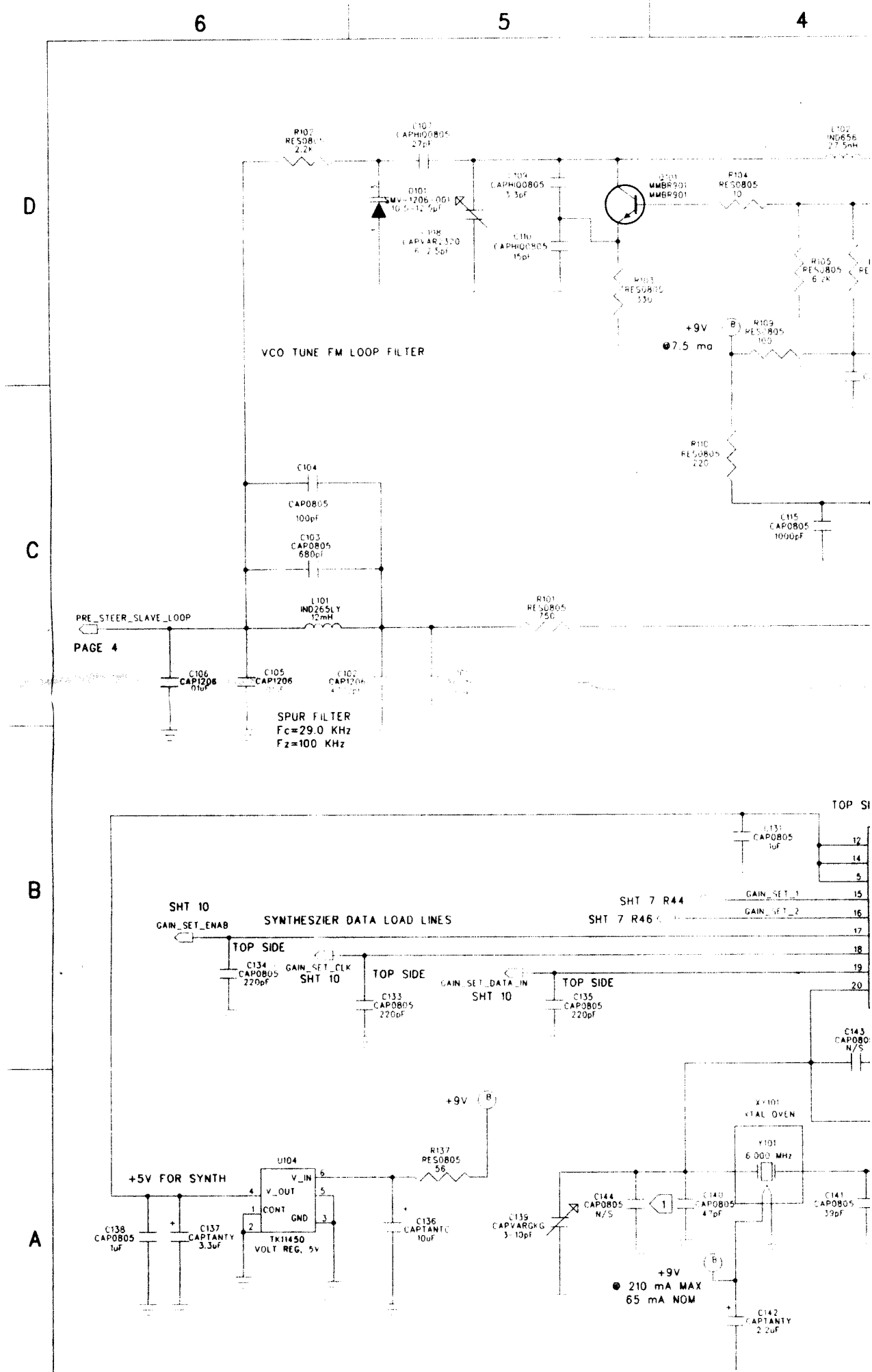
FCC ID: ENPESTEEM192M

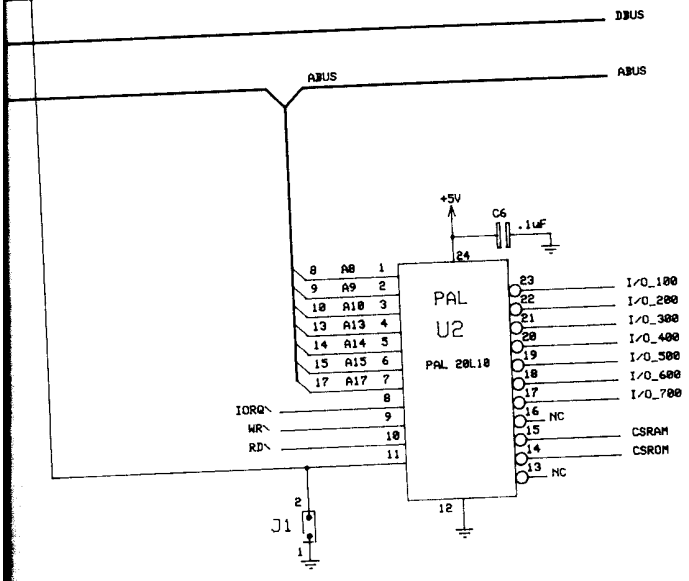
DRAWN	T. Clark
CHECKED	D.B. Strecker
PREL	4/97
NEXT ASSY	80B016
DWG NUMBER	C00406
SYSTEM	192M WIRELESS MODEM
TITLE	90 MHz EXCITER 400 SERIES

ELECTRONIC SYSTEMS TECHNOLOGY


6
5
4
D
C
B
A
+9V (sw)
● 22mA
9V_TRAN_SW
Page 6
R417
RES0805
180
C417
CAP0805
1000pF
R415
RES0805
10
C415
CAP0805
470pF
Exciter Out
-18 dBm
R416
RES0805
43
R414
RES0805
43
EXCITER
Page 4
16 dB pad
MSA0786
RF AMP
MSA-0786
U401
C416
CAP0805
1000pF
R410
RES0805
91
12 dB pad
C414
CAP0805
220pF
L402
C413
CAP0805
120pF
L403
680nH
IND380
R409
RES0805
75
R411
RES0805
82
+5V
R455
RES0805
N/S
R408
RES0805
10
R407
RES0805
120
+9V (sw)
● 4mA
9V_TRAN_SW
Page 6
C438
CAP0805
68pF
MMBT3906
Q404
N/S
Mod Lock
Det. out
MOD_LOCK_DET
Page 8
C449
CAP0805
N/S
R454
RES0805
N/S
R456
RES0805
N/S
C421
CAP0805
01uF
U402
MC145170
PLL FREQ SYNTH
MC145170D
Fc = 100KHz
Ref Freq 125KHz
L406
IND300SS
680uH
R419
RES0805
680
To pt. 'A'
PART_A
C424
CAP0805
1800pF
C422
CAP0805
820pF
L407
IND300SS
680uH
R420
RES0805
680
To pt. 'B'
PART_B
C425
CAP0805
1800pF
C423
CAP0805
820pF
R418
RES0805
1M
Analogue Mod. in
ANALOG_TX
Page 8
2.5 Volts
at Fc
R431
RES0805
10K
R434
RES0805
51K
R436
RES0805
15K
MC33071D
WIDE BAND OP-AMP
U404
R438
RES0805
75K
R437
RES0805
62K
R433
RES0805
15K
R435
RES0805
N/S
C451
CAPTANT
2.2uF
R432
RES0805
18K
+9V reg
● 22.5mA
7mA
U407
VOLT REG 8V
V_IN
V_OUT
GND
CONT
TK11480
C450
CAPTANTC
10uF
(top side)
Missing Dies
Last
Analogue Configuration
NOTES:
1 Factory select as required

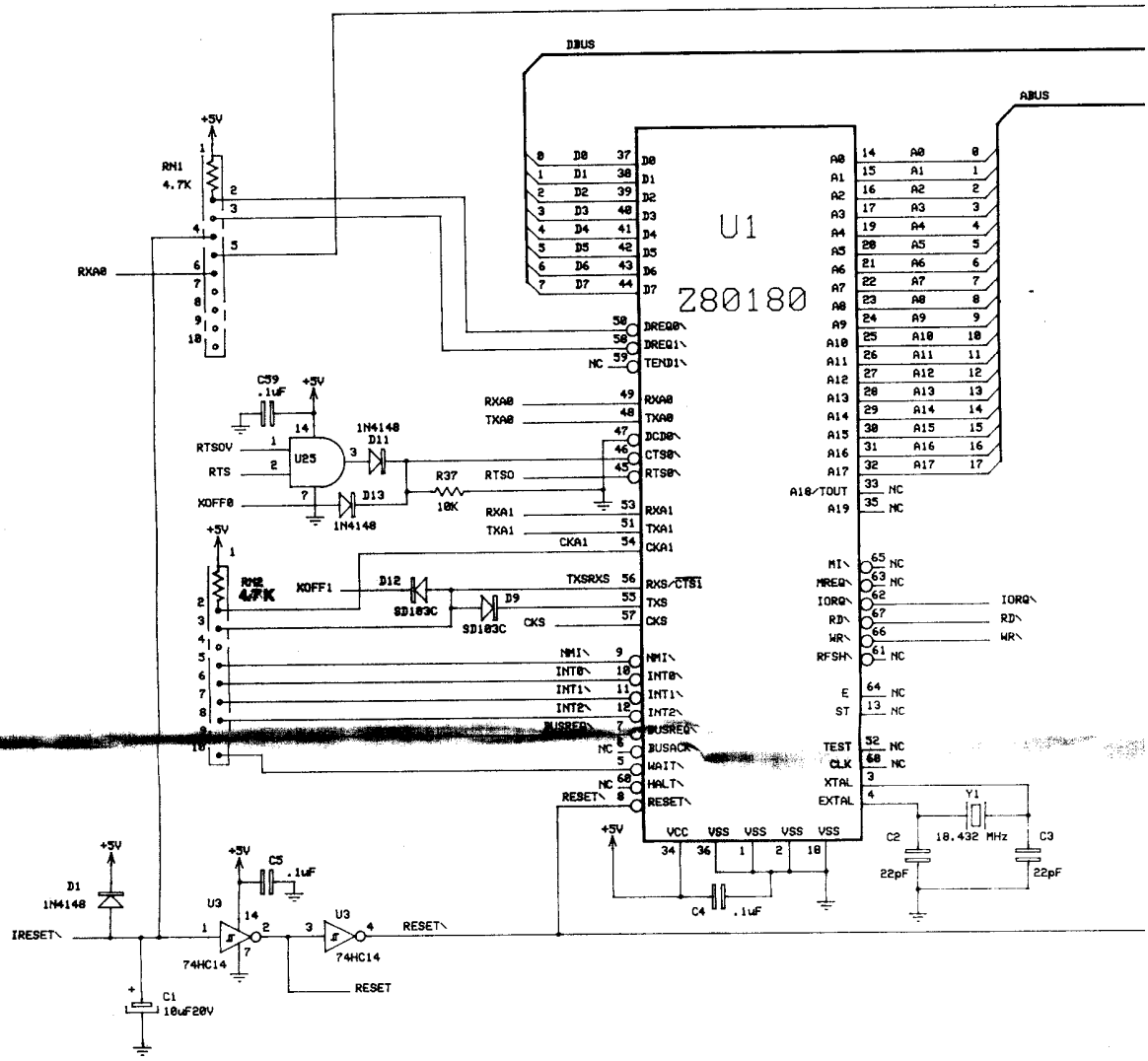

3
2
1
D
C
B
A
DRAWN | REV | ECO # | DESCRIPTION | CHECK. | DATE
+9V
31mA
B
R122 RES0805 75
C120 CAP0805 .01uF
RF AMP
MSA-0386
C119 CAP0805 1000pF
R124 RES0805 10
R123 RES0805 43
R125 RES0805 43
C121 CAP0805 220pF
PAGE 4
OFFSET_MIXER
-17 dBm
546 MHz TO 566 MHz
20 dB PAD
10 dB PAD
L106 IND1L2012 2.2nH
Z101 Z MATCHING ETCHED CKT 1.8nH
C112 CAP0805 100pF
R118 RES0805 68
C118 CAP0805 470pF
U101
L103 IND1L2012 330nH
R119 RES0805 91
R116 RES0805 75
R107 RES0805 47
R117 RES0805 18
R120 RES0805 120
C111 CAP0805 N/S
1
Q102 MMBR901 MMBR901
C116 CAP0805 1000pF
R113 RES0805 5.6K
R111 RES0805 360
NOTES:
1 NOT INSTALLED: C104, C143, C144, C145,
MISSING DES.
C129
R108, R114, R115
R121, R133
LAST DES
C145 R138 L106
Q103 U104 D101
X101 XY101 Z101
3.50 V NOM.
+9V
●1.7 mA
C127 CAP0805 .01uF
R130 RES0805 43K
R132 RES0805 68
C130 CAP0805 1uF
SYNTH
L104 IND300SS 1.0mH
R128 RES0805 10K
C122 CAP0805 220pF
C123 CAP0805 2200pF
C125 CAP0805 4700pF
U103
OP113 LO NOISE OP AMP OP113FS
R126 RES0805 470
L105 IND300SS 1.0mH
R129 RES0805 10K
R127 RES0805 470
C124 CAP0805 2200pF
C126 CAP0805 4700pF
C128 CAP0805 .01uF
R131 RES0805 43K
R134 RES0805 33K
Fc=100 KHz
LOOP BW APPROX 12.000 KHz
+5V
SYN. REG.
D101
FCC ID: ENPESTEEM192M
R135 RES0805 100K
Q103 MMBT3906 MMBT3906
MOD_LOCK_DET
PAGE 10
C132 CAP0805 .1uF
R136 RES0805 12K
MASTER_LOOP
NO CURRENT = HAPPY LOOP
LOCK DET. OUT
WIRED 'OR'
WITH OTHER LOOPS
LO=HAPPY LOOP
DESIGNED 5/96
IDAF8 ENG
DRAWN 8/7/97
D. CROSS
CHECKED 8/10/97
B. STRECKER
UNLESS OTHERWISE SPECIFIED
TOLERANCES
DECIMAL XX +/- .010 XXX +/- .005
FRACTIONAL +/- 1/64
ANGULAR +/- 1/2
HOLE +/- .004 +/- .002
RELEASE
PREL X
PROTO X
QUAL X
PROD. X
NEXT ASSY.
808016
DWG. NUMBER
C00406
ELECTRONIC SYSTEMS TECHNOLOGY
SYSTEM
192M WIRELESS MODEM
162 MHZ
TITLE
MASTER SYNTHESIZER LOOP
100 SERIES


6
5
4
D
C
B
A
R102 RES0805 2.2K
C107 CAPHI00805 27pF
D101 SMV-1206-001 10.5-12.5pF
C108 CAPVAR_320 6-2.5pF
C109 CAP0805 3.3pF
C110 CAPHI00805 15pF
Q101 MMBR901 MMBR901
R104 RES0805 10
L102 IND656 27.5nH
R105 RES0805 6.2K
R103 RES0805 330
+9V @7.5 ma
R109 RES0805 100
R110 RES0805 220
C115 CAP0805 1000pF
VCO TUNE FM LOOP FILTER
C104 CAP0805 100pF
C103 CAP0805 680pF
L101 IND265LY 12mH
R101 RES0805 750
PRE_STEER_SLAVE_LOOP
PAGE 4
C106 CAP1206 .01uF
C105 CAP1206
C102 CAP1206
SPUR FILTER
Fc=29.0 KHz
Fz=100 KHz
TOP SI
C131 CAP0805 1uF
SHT 10
GAIN_SET_ENAB
SYNTHESZIER DATA LOAD LINES
SHT 7 R44
SHT 7 R46
GAIN_SET_1
GAIN_SET_2
TOP SIDE
C134 CAP0805 220pF
GAIN_SET_CLK
SHT 10
C133 CAP0805 220pF
GAIN_SET_DATA_IN
SHT 10
C135 CAP0805 220pF
C143 CAP080 N/S
+9V
+5V FOR SYNTH
U104
V_IN
V_OUT
CONT
GND
TK11450 VOLT REG, 5V
R137 RES0805 56
C138 CAP0805 1uF
C137 CAPTANTY 3.3uF
C136 CAPTANTC 10uF
X-101 XTAL OVEN
Y101 6.000 MHz
C144 CAP0805 N/S
C140 CAP0805 47pF
C141 CAP0805 39pF
C139 CAPVARGKG 3-10pF
+9V @ 210 mA MAX 65 mA NOM
C142 CAPTANTY 2.2uF

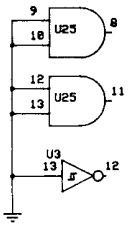


FCC ID: ENPESTEEM192M

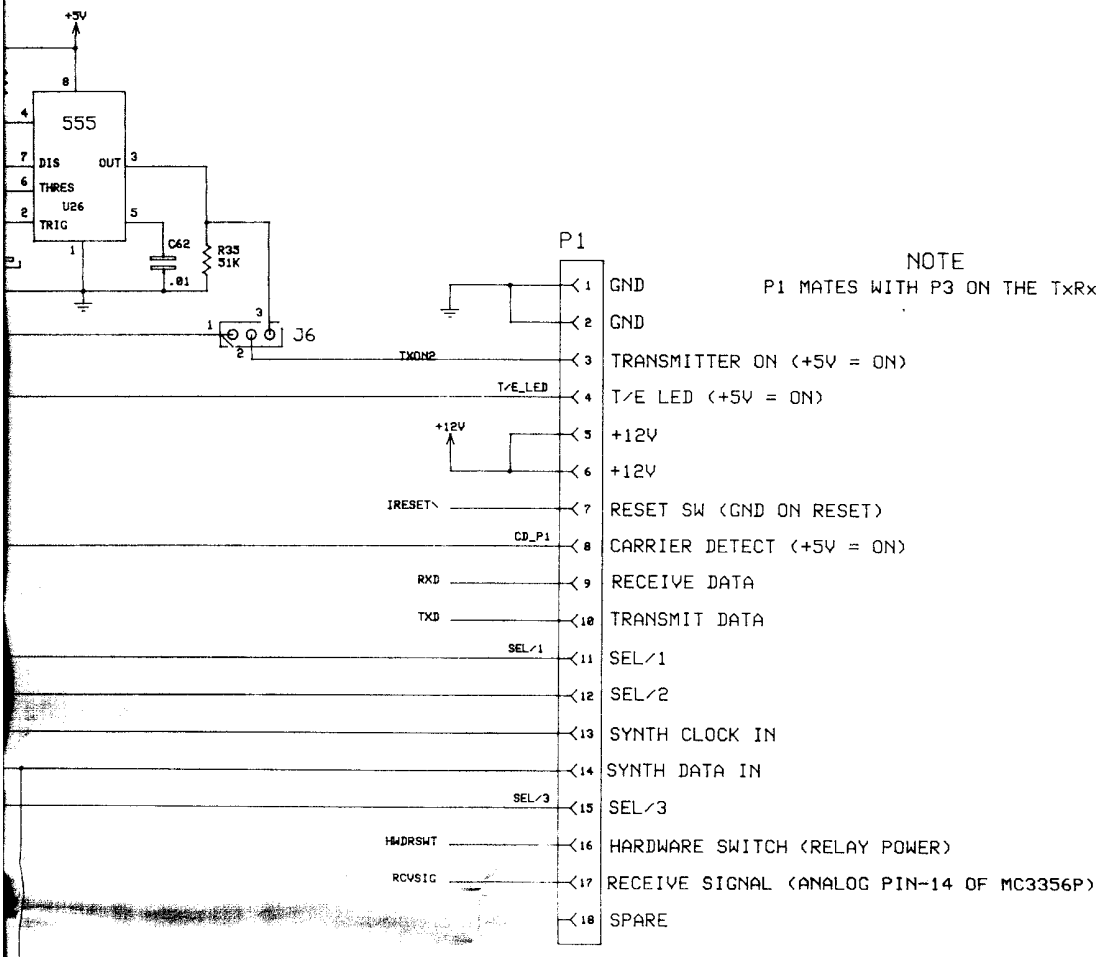
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ±1/64 DECIMALS .XX ±.01 .XXX ±.005 ANGLES ± 2°	CONTRACT NO.	ELECTRONIC SYSTEMS TECHNOLOGY
	APPROVALS / DATE: DRAWN J. C. Fredrickson 10/6/95; CHECKED; MFG.; ENGR.	EST 192 CPU
RELEASES / DATE: PREL.; PROTO.; QUAL.; PROD.	DRAWING NO. C00370	CPU, RESET & I/O DECODE LOGIC
	SIZE C; CODE INDENT NO.	PART NO. 25A100300; REV. 2

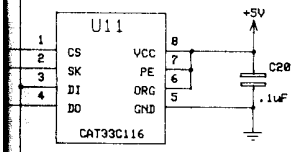


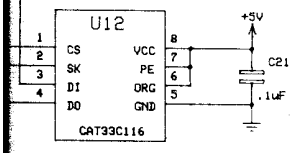
UNUSED GATES



REVISION								
ZONE	LTR		APPROVED	DATE	ZONE	LTR	REVISIC DESCRIPT	
		ADDED U25, C59		1/26/96				

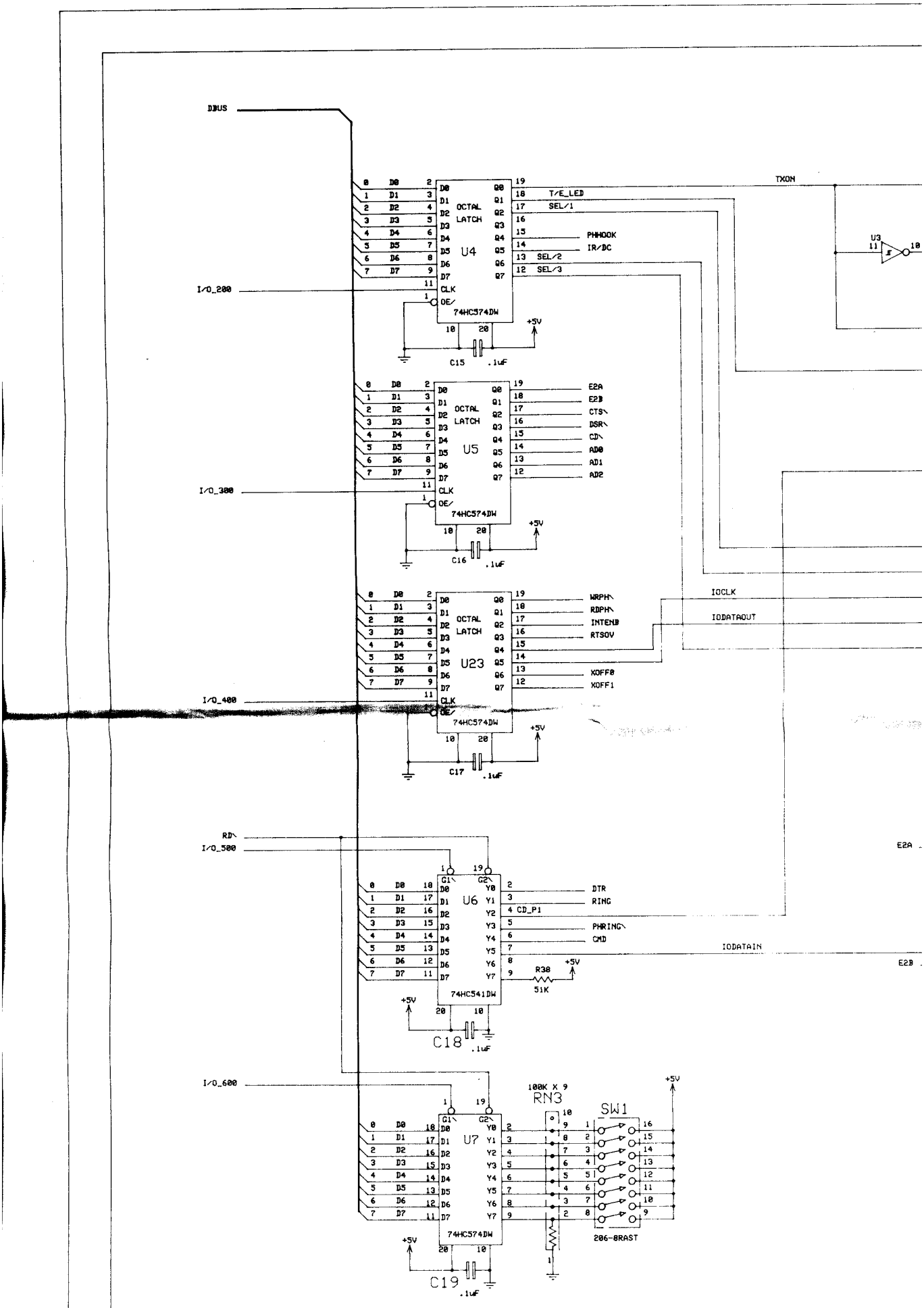




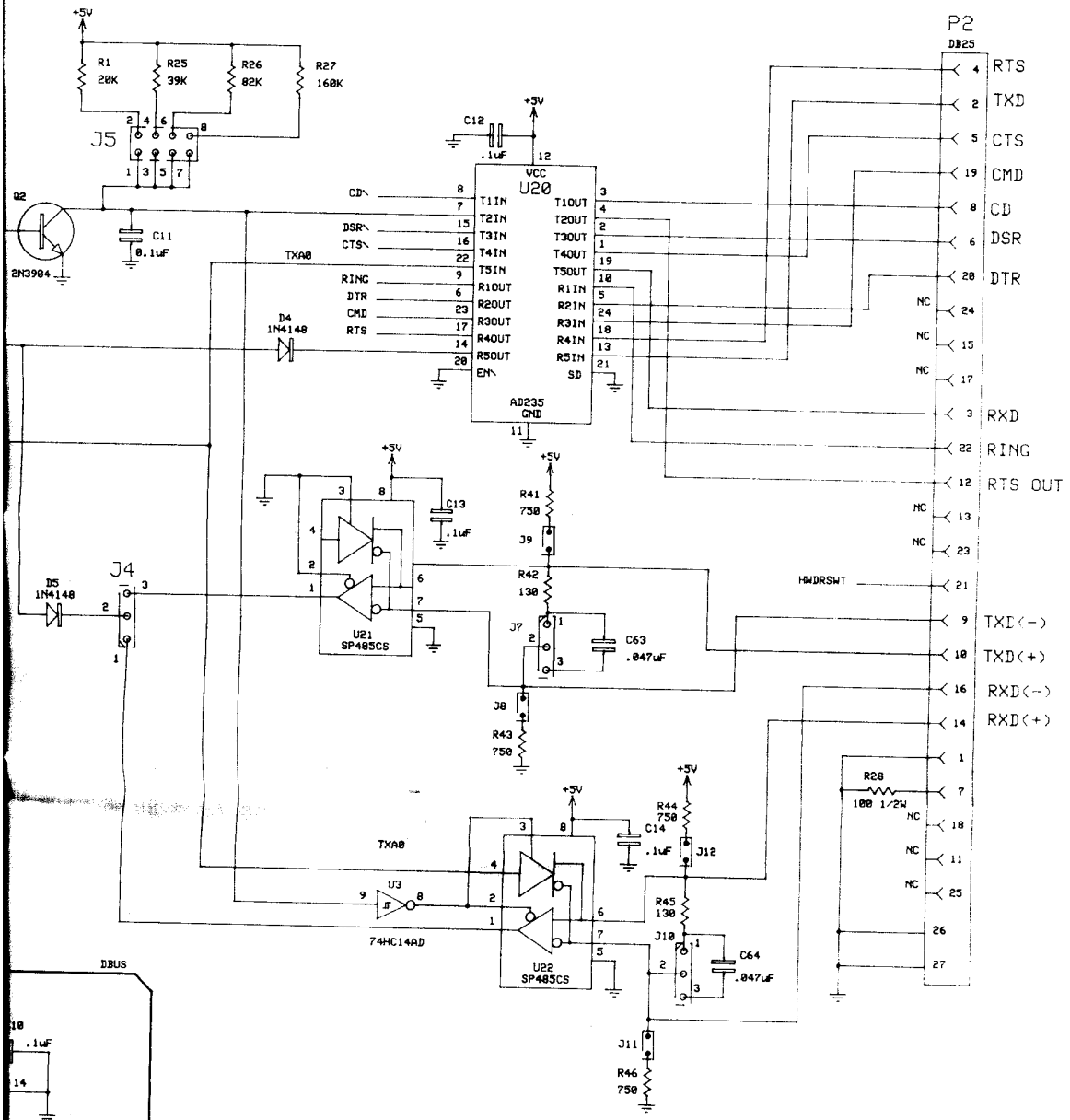


FCC ID: ENPESTEEM192M

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ±1/64 DECIMALS .XX ± .01 .XXX ± .005 ANGLES ± 2°	CONTRACT NO.	ELECTRONIC SYSTEMS TECHNOLOGY
	APPROVALS / DRAWN: J. C. FREDRICKSON / DATE: 10/6/95	EST 192 CPU
RELEASES / DATE: PREL., PROTO., QUAL., PROD.	CHECKED, MFG., ENGR.	LOGIC / BOARD INTERCONNECT
APPROVED / DATE	DRAWING NO. C00370	SIZE C · CODE IDENT NO. · PART NO. 25A100300 · REV. 2
DO NOT SCALE DRAWING	SCALE	SHEET 3 OF 5



REVISION					REVISION		
ZONE	LTR		APPROVED	DATE	ZONE	LTR	DESCRIPTI
		ADDED R32 (390), R38 (51K)		6/14/96			

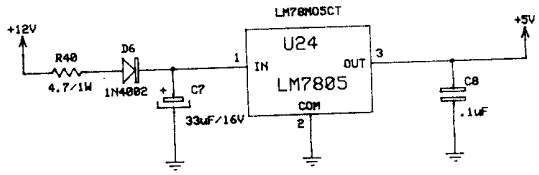


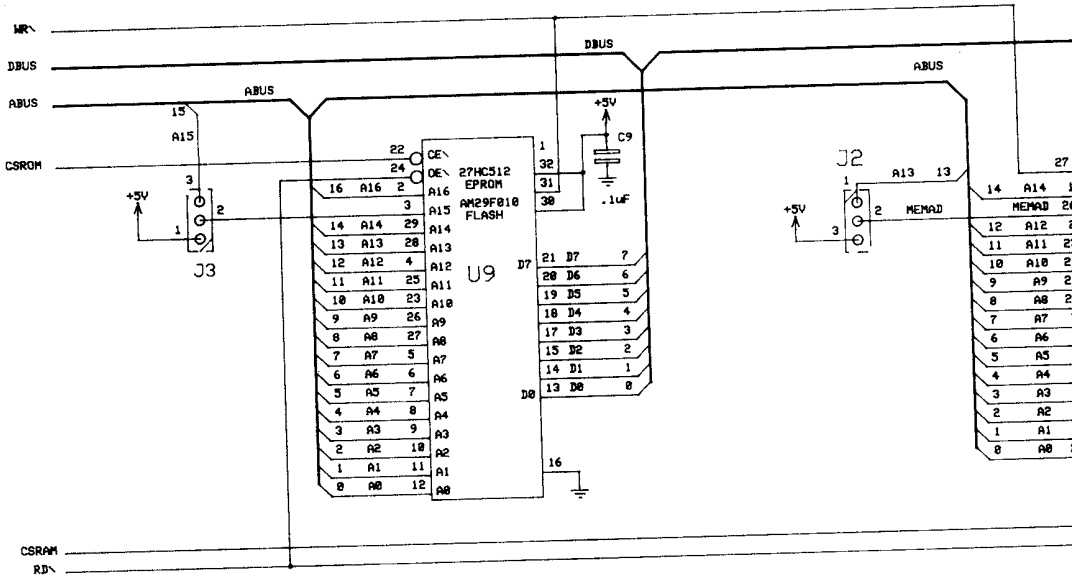
FCC ID: ENPESTEEM192M

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ±1/64 DECIMALS .XX ± .01 .XXX ± .005 ANGLES ± 2°	CONTRACT NO.
RELEASES / DATE: PREL. / PROTO. / QUAL. / PROD.	APPROVALS / DATE: DRAWN J. C. FREDRICKSON 10/6/95; CHECKED; MFG.; ENGR.
DRAWING NO. C00370	ELECTRONIC SYSTEMS TECHNOLOGY
	EST 192 CPU
	MEMORY / RS-232 / RS-485
SIZE C	CODE IDENT NO.
PART NO. 25A100300	REV. 2
DO NOT SCALE DRAWING	

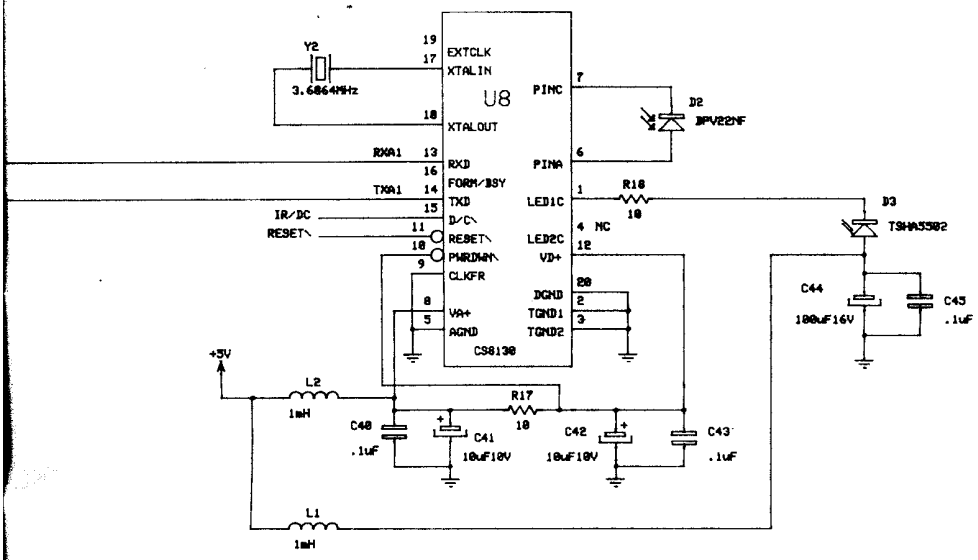
	APPROVED	DATE

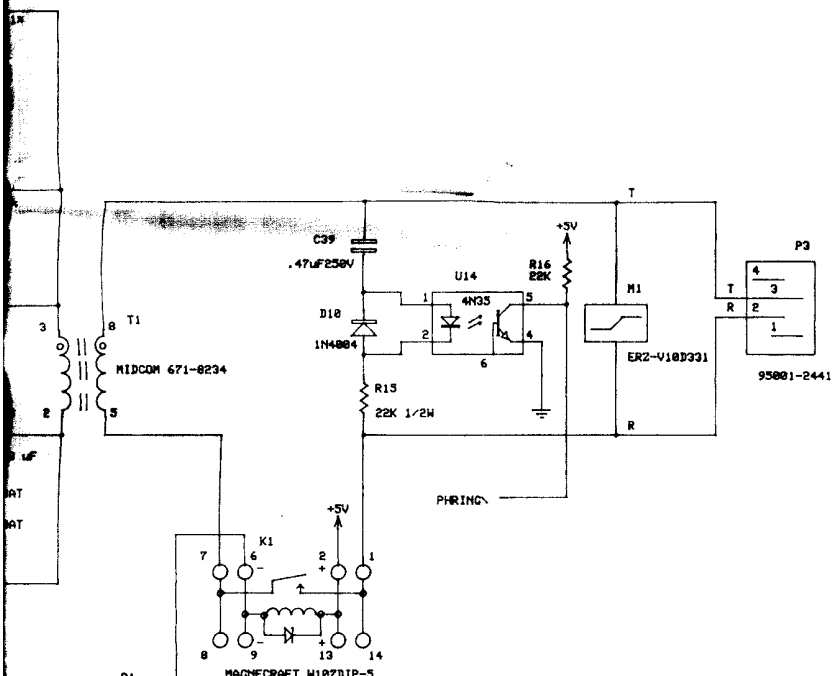
PROVIDE HEAT SINK TO SHIELD





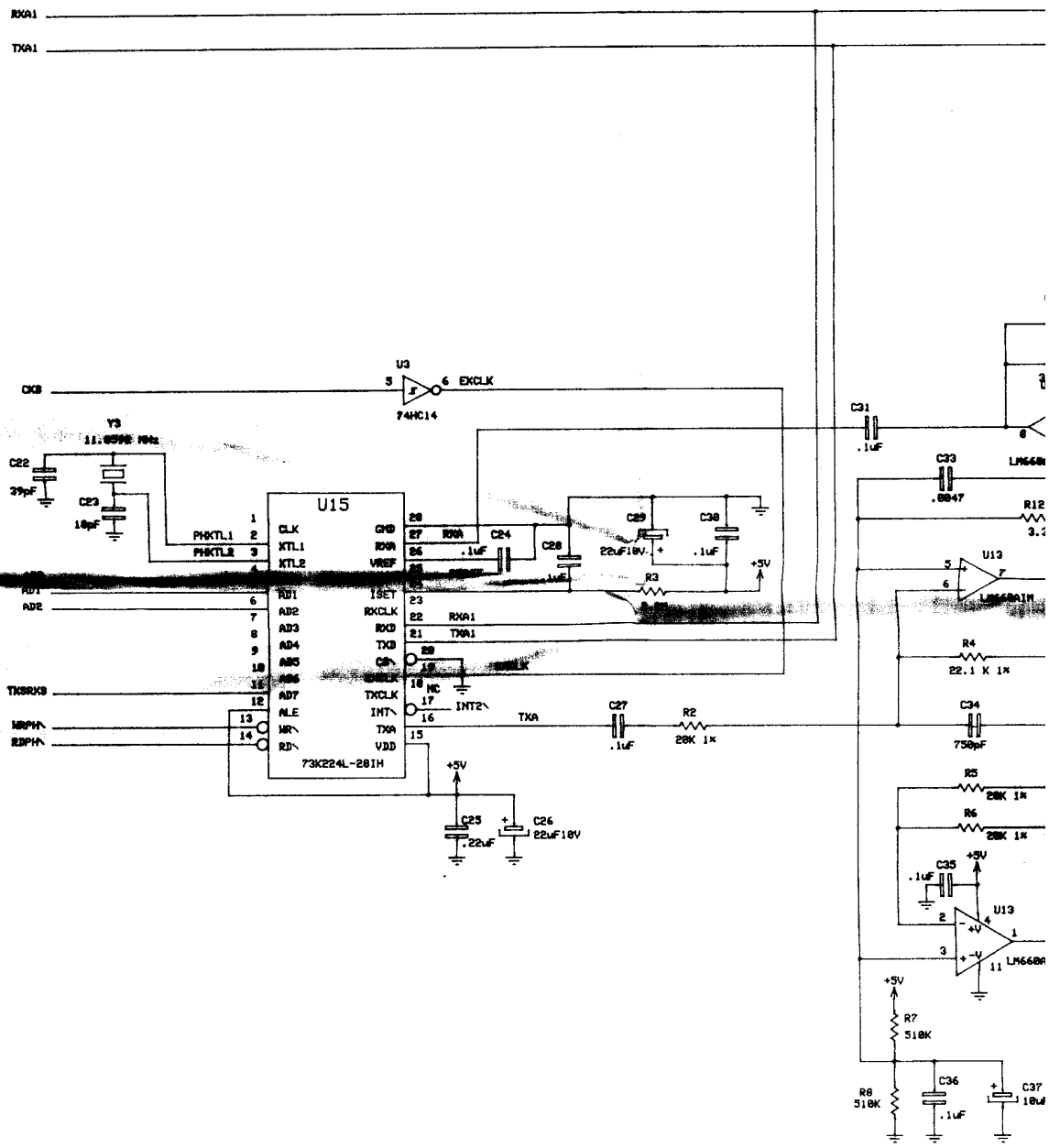
REVISION						REVISION
		APPROVED	DATE	ZONE	LTR	DESCRIPTION





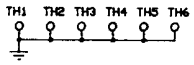
FCC ID: ENPESTEEM192M

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ±1/64 DECIMALS .XX ± .01 .XXX ± .005 ANGLES ± 2°	CONTRACT NO.	ELECTRONIC SYSTEMS TECHNOLOGY	
RELEASES / DATE: PREL., PROTO., QUAL., PROD.	APPROVALS / DATE: DRAWN J. C. FREDRICKSON 10/6/95; CHECKED; MFG.; ENGR.	EST 192 CPU PHONE/IR	
APPROVED / DATE	DRAWING NO. C00370	SIZE C	CODE INDENT NO.
DO NOT SCALE DRAWING		SCALE	PART NO. 25A100300 REV. 2
			SHEET 4 OF 5



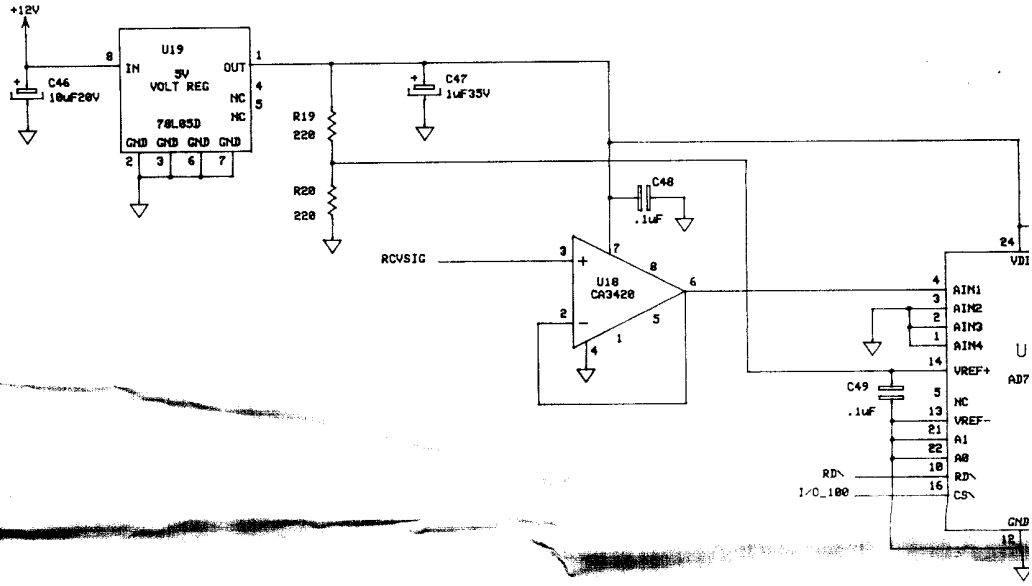
REVISION							
ZONE	LTR		APPROVED	DATE	ZONE	LTR	DESCR

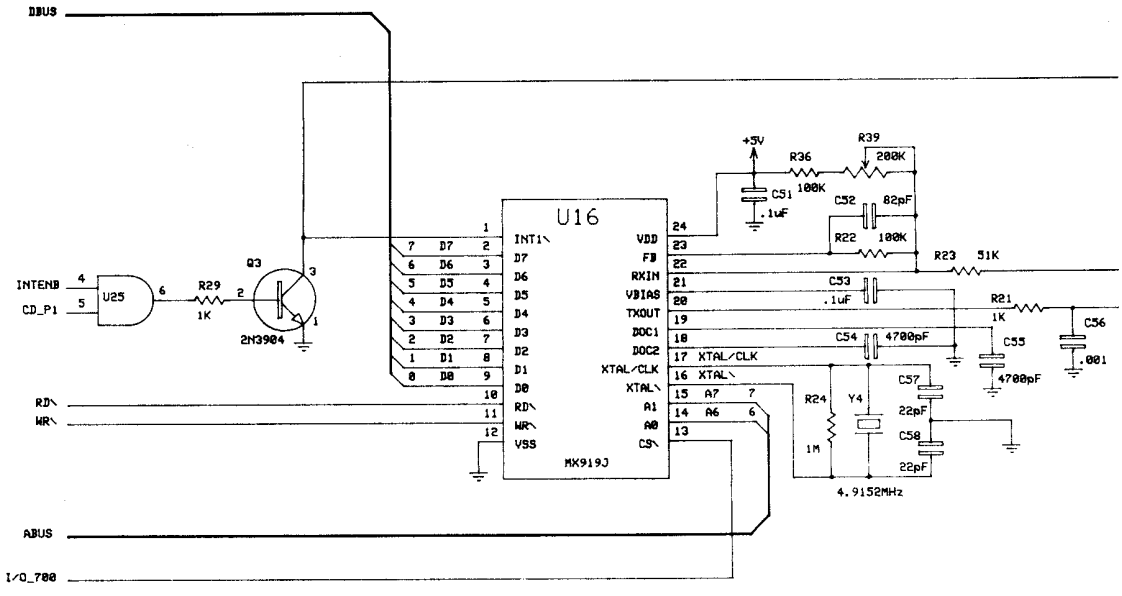
TOOLING HOLES



FCC ID: ENPESTEEM192M

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ±1/64, DECIMALS .XX ± .01 .XXX ± .005, ANGLES ± 2°	CONTRACT NO.		ELECTRONIC SYSTEMS TECHNOLOGY
RELEASES / DATE: PREL., PROTO., QUAL., PROD.	APPROVALS / DATE: DRAWN J. C. FREDRICKSON 10/6/95; CHECKED; MFG.; ENGR.		EST 192 CPU RF MODEM / RECEIVE SIGNAL
APPROVED / DATE	DRAWING NO. C00370	SIZE C / CODE INDENT NO. / PART NO. 25A100300 / REV. 2	
DO NOT SCALE DRAWING		SCALE	SHEET 5 OF 5





REVISION					REVISION		
ZONE	LTR		APPROVED	DATE	ZONE	LTR	DESCRIPTION
		ADDED U25, R29, Q3		1/26/95			