บรรณานุกรม

1. Engineering Staff of Texas Instrument, "Circuit Design for audio, AM/FM and TV." U.S.A.: Texas Instrument, 1967.

ภาคผนวก

โปรแกรมคอมพิวเตอร์ และรายงานต่างๆ

หน้า 125 -148

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FORTRAN   200      SOURCE LISTING AND DIAGNOSTICS                    PROGRAM: 000000

                C     FIRST PART.                                                    001
                C     THE PROGRAM TO READ THE DATA AND WRITE THE DATA DESCRIPTION.   002
                C
                C     THIS IS THE MASTER THESIS OF MR. PISUT STAPORNPOORISARK.       003
                C     THE PROGRAM OF THE TELEVISION TUNER DESIGNING.                 004
      001             COMMON IRAC5(13),FRF,CBW,AIF,AIE06,VCC06,VCE06,PK6,PRATE6,FT6,RBCC 005
                     16, S06,CD06,CD16,RI6,CI6,RO6,CO6,CCB6,AY11,BY11,AY12,BY12,AY21,BY2 006
                     11,AY22,BY22,AIE05,VCC05,VCE05,PK5,PRATE5,FT5,RBCC5,S05,CD05,CDI5,R 007
                     1I5,CI5,RO5,CO5,CCB5,AIE07,VCC07,VCE07,PK7,PRATE7,FT7,RBCC7,S07,    008
                     1T,COSC,QUUL3,BW3,BWPTP,BW2,C1,C2,RBAF,CBAF,QUUL1,QUUL2,FOSC,JH,QLC 009
                     16,R8,R9,R10                                                   011
      002             READ(2,901)JH                                                 012
      003        901  FORMAT(I2)                                                    013
      004             READ(2,903) FRF,CBW,AIF                                       014
      005        903  FORMAT(3E7.3)                                                 015
      006             READ(2,908) AIE06,VCC06,VCE06,PK6,PRATE6,FT6,RBCC6,S06,CD06,CDI6 016
      007        908  FORMAT(10E7.3)                                                017
      010             READ(2,912) RI6,CI6,RO6,CO6,CCB6                              018
      011        912  FORMAT(5E7.3)                                                 019
      012             READ(2,914) AY11,BY11,AY12,BY12,AY21,BY21,AY22,BY22           020
      013        914  FORMAT(8E7.2)                                                 021
      014             READ(2,918) AIE05,VCC05,VCE05,PK5,PRATE5,FT5,RBCC5,S05,CD05,CDI5 022
      015        918  FORMAT(10E7.3)                                                023
      016             READ(2,922) RI5,CI5,RO5,CO5,CCB5                              024
      017        922  FORMAT(5E7.3)                                                 025
      020             READ(2,928) AIE07,VCC07,VCE07,PK7,PRATE7,FT7,RBCC7,S07        026
      021        928  FORMAT(8E7.3)                                                 027
      022             READ(2,924)    T,COSC,QUUL3                                   028
      023        924  FORMAT( 3E7.3)                                                029
      024             READ(2, 926)BW3,BWPTP,BW2                                     030
      025        926  FORMAT(3E7.3)                                                 031
      026             READ(2, 938)C1,C2,RBAF,CBAF,QUUL1,QUUL2,FOSC                  032
      027        938  FORMAT(7E7.3)                                                 033
      030             READ(2,942) (IRAC5(I),I=1,13)                                 034
      031        942  FORMAT(12I2,I3)                                               035
      032             WRITE(3,900)                                                  036
      033        900  FORMAT(1H1///////)                                            037
      034             WRITE(3,930)JH,FRF,CBW,AIF,                                   038
                     1AIE06,VCC06,VCE06,PK6,PRATE6,FT6,RBCC6,S06,CD06,CDI6,         039
                     1RI6,CI6,RO6,CO6,CCB6,                                         040
                     1AY11,BY11,AY12,BY12,AY21,BY21,AY22,BY22,                      041
                     1AIE05,VCC05,VCE05,PK5,PRATE5,FT5,RBCC5,S05,CD05,CDI5,         042
                     1RI5,CI5,RO5,CO5,CCB5,                                         043
                     1AIE07,VCC07,VCE07,PK7,PRATE7,FT7,RBCC7,S07,                   044
                     1   T,COSC,QUUL3,BW3,BWPTP,BW2,                              045
                     1C1,C2,RBAF,CBAF,QUUL1,QUUL2,FOSC                              046
      035        93   FORMAT(1H1/////                                               047
                     1   15X, 7HCHANNEL,1X,I2//                                     047
                     1   15X,37HSPECIFICATION OF FCC TO THE TV TUNER.//             048
                     1   15X,3HH      RADIO FREQUENCY,(F(RF)) =, 2X,E12.5,2X,2HHZ/  049
                     1   15X,3HH      CHANNEL BANDWIDTH,(BW) =,2X,E12.5,2X,2HHZ/    050
                     1   15X,3HH    IF CENTER FREQUENCY,(IF) =,2X,E12.5,2X,2HHZ//   051
                     1                          36X,10H**********//                 052
                     1   13X,23H1. DATA SHEET OF TIXM06/                            053
                     1   15X,3HH      EMITTER CURRENT,(IC) =,2X,E12.5,2X,4HAMPS/    054
                     1   15X,3HH  POWER SUPPLY VOLTAGE,(VCC) =,2X,E12.5,2X,5HVOLTS/ 055
                     1   15X,3HCOR-R TO EMI-R VOLTAGE,(VCE) =,2X,E12.5,2X,5HVOLTS/  057
                     1   15X,3HH   POWER DERATING FACTOR,(K) =,2X,E12.5,2X,6HWATT/C/ 058
                     113X,32HRATED DEVICE DISSIPATION,PRATE =,2X,E12.5,2X,4HWATT/    059
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      1  15X,30H FREQUENCY AT 1 DB GAIN,(FT) =,2X,E12.5,2X,2HHZ/                  060
      1  15X,30H                        RBCC =,2X,E12.5,2X,10HPICOSECOND/         061
      1  15X,30H                  STABILITY,(S) =,2X,E12.5/                       062
      1  15X,30HOUTPUT DISTRIBUTION C,(CDO6) =,2X,E12.5,2X,5HFARAD/               063
      1  15X,30H INPUT DISTRIBUTION C,(CDI6) =,2X,E12.5,2X,5HFARAD//              064
      1  15X,35H AT IF CENTER FREQUENCY = 43.5  MHZ/                              065
      1  15X,35HWITH INPUT RF FREQUENCY =213.5  MHZ/                              066
      1  15X,35HAND OSCILLATOR FREQUENCY=257.0  MHZ//                             067
      1  15X,30H      INPUT RESISTANCE(RIEP) =,2X,E12.5,2X,3HOHM/                 068
      1  15X,30H    INPUT CAPACITANCE(CIEP) =,2X,E12.5,2X,5HFARAD/                069
      1  15X,30H     OUTPUT RESISTANCE(ROEP) =,2X,E12.5,2X,3HOHM/                 070
      1  15X,30H   OUTPUT CAPACITANCE(COEP) =,2X,E12.5,2X ,5HFARAD/               071
      1  15X,30H     C-B CAPACITANCE (CCB) =,2X,E12.5,2X,5HFARAD//                072
      1  15X,20HADMITTANCE DATA SET,/                                             073
      1  15X,30H              REAL PART OF Y11 =,2X,E12.5,2X,3HMHO/               074
      1  15X,30H         IMAGINARY PART OF Y11 =,2X,E12.5,2X,3HMHO/               075
      1  15X,30H              REAL PART OF Y12 =,2X,E12.5,2X,3HMHO/               076
      1  15X,30H         IMAGINARY PART OF Y12 =,2X,E12.5,2X,3HMHO/               077
      1  15X,30H              REAL PART OF Y21 =,2X,E12.5,2X,3HMHO/               078
      1  15X,30H         IMAGINARY PART OF Y21 =,2X,E12.5,2X,3HMHO/               079
      1  15X,30H              REAL PART OF Y22 =,2X,E12.5,2X,3HMHO/               080
      1  15X,30H         IMAGINARY PART OF Y22 =,2X,E12.5,2X,3HMHO//              081
      1                        36X,10H**********//                                082
      1  13X,23H2. DATA SHEET OF TIXM05/                                          083
      1  15X,30H      EMITTER CURRENT,(IC) =,2X,E12.5,2X,4HAMPS/                  084
      1  15X,30H  POWER SUPPLY VOLTAGE,(VCC) =,2X,E12.5,2X,5HVOLTS/               085
      1  15X,30HCOR-R TO EMI-R VOLTAGE,(VCE) =,2X,E12.5,2X,5HVOLTS/               086
      1  15X,30H   POWER DERATING FACTOR,(K) =,2X,E12.5,2X,6HWATT/C/              087
     11 3X,32HRATED DEVICE DISSIPATION,PRATE =,2X,E12.5,2X,4HWATT/                088
      1  15X,30H FREQUENCY AT 1 DB GAIN,(FT) =,2X,E12.5,2X,2HHZ/                  089
      1  15X,30H                        RBCC =,2X,E12.5,2X,10HPICOSECOND/         090
      1  15X,30H                  STABILITY,(S) =,2X,E12.5/                       091
      1  15X,30HOUTPUT DISTRIBUTION C,(CDO5) =,2X,E12.5,2X,5HFARAD/               092
      1  15X,30H INPUT DISTRIBUTION C,(CDI5) =,2X,E12.5,2X,5HFARAD/////           093
      1  15X,30H      INPUT RESISTANCE(RIEP) =,2X,E12.5,2X,3HOHM/                 094
      1  15X,30H    INPUT CAPACITANCE(CIEP) =,2X,E12.5,2X,5HFARAD/                095
      1  15X,30H     OUTPUT RESISTANCE(ROEP) =,2X,E12.5,2X,3HOHM/                 096
      1  15X,30H   OUTPUT CAPACITANCE(COEP) =,2X,E12.5,2X ,5HFARAD/               097
      1  15X,30H     C-B CAPACITANCE (CCB) =,2X,E12.5,2X,5HFARAD//                098
      1  13X,23H3. DATA SHEET OF TIXM07/                                          099
      1  15X,30H      EMITTER CURRENT,(IC) =,2X,E12.5,2X,4HAMPS/                  100
      1  15X,30H  POWER SUPPLY VOLTAGE,(VCC) =,2X,E12.5,2X,5HVOLTS/               101
      1  15X,30HCOR-R TO EMI-R VOLTAGE,(VCE) =,2X,E12.5,2X,5HVOLTS/               102
      1  15X,30H   POWER DERATING FACTOR,(K) =,2X,E12.5,2X,6HWATT/C/              103
     11 3X,32HRATED DEVICE DISSIPATION,PRATE =,2X,E12.5,2X,4HWATT/                104
      1  15X,30H FREQUENCY AT 1 DB GAIN,(FT) =,2X,E12.5,2X,2HHZ/                  105
      1  15X,30H                        RBCC =,2X,E12.5,2X,10HPICOSECOND/         106
      1  15X,30H                  STABILITY,(S) =,2X,E12.5//                      107
      1  13X,21H4. THE SPECIAL DATA I/13X,12HA. AT MIXER,/                        108
      1  15X,30H      AMBIENT TEMPERATURE(T) =,2X,E12.5,2X,10HCENTIGRADE/         110
      1  15X,30H  CAP-CE LOAD OF OSC-R(COSC) =,2X,E12.5,2X,5HFARAD/               111
      1  15X,30H  UNLOADED UNCOUPLED Q,QUUL3 =,2X,E12.5,2X//                      112
      1  13X,19HB. AT RF AMPLIFIER,/                                              113
      1  15X,30H  BANDWIDTH OF SECONDARY(L3) =,2X,E12.5,2X,2HHZ/                  114
      1  15X,30HBANDWIDTH PEAK TO PEAK,BWPTP =,2X,E12.5,2X,2HHZ/                  115
      1  15X,30H  BANDWIDTH OF PRIMARY  (L2) =,2X,E12.5,2X,2HHZ/ /                116
      1  13X,29HC. AT INPUT MATCHING CIRCUIT,/                                    117
      1  15X,30H  I/P SERIE CAPACITANCE (C1) =,2X,E12.5,2X,5HFARAD/               118
      1  15X,30H  I/P PARALLEL CAPACITANCE (C2) =,2X,E12.5,2X,5HFARAD/            119
      1  15X,30H      BALUN AND FILTER O/P R =,2X,E12.5,2X,3HOHM/                  120
      1  15X,30H      BALUN AND FILTER O/P C =,2X,E12.5,2X,5HFARAD/                121
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     1  15X,30H       UNLOADED Q OF COIL L1  =,2X,E12.5/                    122
     1  15X,30H       UNLOADED Q OF COIL L2  =,2X,E12.5/                    123
     1  15X,30H OSCILLATOR FREQUENCY(FOSC)   =,2X,E12.5,2X,2HHZ//)          124
036       WRITE(3,945) (IRACS(I),I=1,13)                                    125
037  945 FORMAT(13X,21H5. THE SPECIAL DATA 2///15X,47HTHE STANDARD RESISTAN  126
     1CE AND CAPACITANCE SERIES,///15X,12(2X,I2),2X,I3//                    127
     136X,10H**********//)                                                 128
040       WRITE(3,948)                                                      129
041  948 FORMAT(1H1)                                                        130
042       CALL CHAIN 2                                                      131
043       STOP                                                              132
044       END                                                               133
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*CHAIN,2                                                          134
FORTRAN   200      SOURCE LISTING AND DIAGNOSTICS                 PROGRAM: 000000
      C                                                                          135
      C                                                                          136
      C     SECOND PART.                                                         137
      C     THIS IS THE PROGRAM OF THE TELEVISION TUNER DESIGNING.               138
001         COMMON IRACS(13),FRF,C3W,AIF,AIE06,VCC06,VCE06,PK6,PRATE6,FT6,RBCC   139
           16, S06,CD06,CDI6,RI6,CI6,R06,C06,CCB6,AY11,BY11,AY12,BY12,AY21,BY2   140
           11,AY22,BY22,AIE05,VCC05,VCE05,PK5,PRATE5,FT5,RBCC5,S05,CD05,CDI5,R   141
           1I5,CI5,R05,C05,CCB5,AIE07,VCC07,VCE07,PK7,PRATE7,FT7,RBCC7,S07,      142
           1T,COSC,QUUL3,BW3,BWPTP,BW2,C1,C2,RBAF,CBAF,QUUL1,QUUL2,FOSC,JH,QLC   143
           14,FMAX,AMAG,DCL,AML,ALOS,P36,AIL,C8,CL4,CL2,C4,CN,C3,CL3,C5,C6,AMA   144
           1G2,TTGAIN,AL1,CL1,AML1,TLOS,BWI,CL5,R3,R2,PDS05,TMAX,R4,R5,R6,PDS0   145
           16,R8,R9,R10                                                          146
002         WRITE(3,505)(IRACS(I),I=1,13)                                        147
003       505 FORMAT(1H1////17X,17HTHE SPECIAL DATA.///17X,47HTHE STANDARD RESI   148
           1STANCE AND CAPACITANCE SERIES.///15X,12(2X,I2),2X,I3///17X,31HTHE    149
           1 INPUT DATA OF THIS PROGRAM.//)                                      150
004         WRITE(3,2)FRF,C3W,AIF                                                151
005         2 FORMAT(15X,3E12.5//)                                               152
006         4 FORMAT(15X,5E12.5/15X,2E12.5//)                                    153
007         WRITE(3,6)R06,RI6,CI6,C06,CCB6                                       154
010         6 FORMAT(15X,5E12.5//)                                               155
011         WRITE(3,8)AY11,BY11,AY12,BY12,AY21,BY21,AY22,BY22                    156
012         8 FORMAT(15X,5E12.5/15X,3E12.5//)                                    157
013         WRITE(3,4)  AIE06,VCC06,VCE06,PK6,PRATE6,FT6,RBCC6                   158
014         WRITE(3,10)FT5,RBCC5                                                 159
015        10 FORMAT(15X,2E12.5//)                                               160
016         WRITE(3,12)RI5,CI5,RD5,C05,CCB5,CD05                                 161
017        12 FORMAT(15X,5E12.5/15X, E12.5//)                                    162
020         WRITE(3,14)QUUL3,   CD06,S06,CDI6,T,COSC                             163
021         WRITE(3,15)C1,C2,RBAF,CBAF,QUUL1,QUUL2,FOSC                          164
022        15 FORMAT(15X,5E12.5/15X,2E12.5//)                                    165
023        14 FORMAT(15X,4E12.5/15X,2E12.5//)                                    166
024         WRITE(3,16)CDI5,BW3 ,BWPTP,BW2                                       167
025        16 FORMAT(15X,4E12.5//)                                               168
026         WRITE(3,18)C1,C2,RBAF,CBAF,QUUL1,QUUL2,FOSC                          169
027        18 FORMAT(15X,5E12.5/15X,2E12.5//1H1)                                 170
      C                                                                          171
      C                                                                          172
      C     SECTION 1                                                            173
      C     THE PRERIMINARY CALCULATION AT THE MIXER STAGE.                      174
      C     THE CALCULATION OF THE MAXIMUM GAIN AND THE MISMATCH FACTOR.         175
030         QLC4=AIF/C3W                                                         176
031         FMAX=SQRT(FT6/(8.*3.14*(RBCC6)))                                     177
032         AMAG=20.*ALOG10(FMAX/AIF)                                            178
033         AA=FRF/320.E+06                                                      179
034         DCL=20.*ALOG10(1.054+AA)                                             180
035         GG=AY11                                                              181
036         G22=AY22                                                             182
037         G11=GG                                                               183
040         VA=AY12                                                              184
041         VJB=BY12                                                             185
042         VC=AY21                                                              186
043         VJD=BY21                                                             187
044         CALL CMMUL(VA,VJB,VC,VJD)                                            188
045         AM=VA                                                                189
046         AL=SQRT(VA**2+VJB**2)                                                190
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047           GL=(AL+AM)/(2.*(G11+GG))-G22                                    191
                                                                              192
050           WRITE(3,200)                                                    193
051       200 FORMAT(1H1/////17X,17HTHE FIRST REPORT.// )                     194
052           WRITE(3,205)QLC4,EMAX,AMAG,AA,DCL,GG,G22,G11,AM,AL,GL           195
053       205 FORMAT(17X,10HSECTION 1.///23X,4HQLC4,8X,4HEMAX,8X,4HAMAG,10X,2HAA 196
              1,9X,3HDCL,10X,2HGG/15X,6E12.5//24X,3HG22,9X,3HG11,10X,2HAM,10X,2HA 197
              1L,10X,2HGL/15X,5E12.5////)                                     200
          C                                                                   201
          C                                                                   203
          C       SECTION 2                                                   204
          C       THE CALCULATION OF THE TOTAL LOSS AND TOTAL POWER GAIN.     205
054           A=GL/G22                                                        206
055           ALOS=10.*ALOG10((1.+A**2)/(4.*A))                               207
056           AIL=(ALOS-DCL)                                                  208
057           WRITE(3,218)A,ALOS,AIL                                          209
060       218 FORMAT(17X,10HSECTION 2.///26X,1HA,8X,4HALOS,9X,3HAIL/15X,3E12.5// 210
              1)                                                              211
061           CL=0.290*AIL                                                    212
062           AML=0.710*AIL                                                   213
063           ANGL=CL /20.                                                    214
064           X=ANGL                                                          215
065           CALL ATLOG(X,ALOP)                                              216
066           Y=ALOP                                                          217
067           QUU4=Y*QLC4/(Y-1.)                                              218
070           PG6=AMAG-(AML+CL+DCL)                                           219
071           WRITE(3,219) CL,AML,ANGL,Y,QUU4,PG6                             220
072       219 FORMAT(15X,10X,2HCL,9X,3HAML,8X,4HANGL,11X,1HY,8X,4HQUU4,9X,3HPG6/ 221
              115X,6E12.5//)                                                  300
          C                                                                   301
          C                                                                   302
          C       SECTION 3                                                   303
          C       CALCULATE THE INDUCTANCE (L4) BY USING STEPPING METHOD.     304
073           X=AML/10.                                                       305
074           CALL ATLOG(X,ALOP)                                              306
075           Y=ALOP                                                          307
076           WRITE(3,19)Y                                                    308
077        19 FORMAT(17X, 9HSECTION 3///17X,1HY/15X,E12.5//)                  309
100           AMISM=(-(2.-4.*Y)+SQRT((2.-4.*Y)**2-4.))/2.                     310
101           WRITE(3,304)AMISM                                               311
102       304 FORMAT(17X,5HAMISM/15X,E12.5//)                                 312
103       305 RLR=RO6/AMISM                                                   313
104           WRITE(3,310) RLR                                                314
105       310 FORMAT(17X,3HRLR/15X,E12.5//)
106           AL4=0.02E-06
          C       ASSUME THE VALUE OF DELTA(DEL).                             316
107           DEL=0.10E-06                                                    317
110           W2=2.*3.14*AIF                                                  318
111       315 AL4=AL4+0.001E-06
112       316 REP=QUU4*W2*AL4                                                 321
113           YRT=1./RO6+1./REP+1./RLR                                        322
114           RT6=1./YRT                                                      323
115           CT6=QLC4/(W2*RT6)                                               324
116           CL4=1./(CT6*(W2**2))                                            325
117           XK=ABS(AL4-CL4)                                                 326
          C       COMPARE THE DIFFERENT VALUE OF AL4 AND CL4 WITH DEL.        327
120        32 IF(XK-DEL)325,325,315                                           328
          C       THE DIFFERENT VALUE IS LESS THAN DELTA.                     329
121       325 IF(DEL-0.10E-06)335,330,335                                     330
          C       CHANGE THE VALUE OF DEL TO 1 PCT. OF AL4.                   331
122       330 DEL=0.01*AL4                                                    332
123           GO TO 320                                                       333
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124       335 C8=CT6-(CO6+CD06)                                                  334
125           H8 = C8                                                            335
126           ROCIP=C8                                                           336
127           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                    337
130           C8 = ROCOP                                                         338
131           WRITE(3,340)CL4,REP,YRT,RT6,AL4,H8                                 339
132       340 FORMAT(24X,3HCL4,9X,3HREP,9X,3HYRT,9X,3HRT6,9X,3HAL4/15X,5E12.5/25 340
              1X,2HC8/15X,E12.5////)                                             341
                                                                                 400
          C                                                                      401
          C                                                                      402
          C     SECTION 4                                                        403
          C     CALCULATE AT THE RADIO FREQUENCY AMPLIFIER STAGE.                404
          C     FIND THE VALUE OF INDUCTANCE L2.                                 405
133           W=2.*3.14*FRF                                                      406
134           DEL=0.025E-06
135           AL2=6.0E-08
136       520 AL2=AL2+0.1E-08                                                    410
137       521 REP5=QUUL2*W*AL2                                                   411
140           RT5=RO5*REP5/(RO5+REP5)                                            412
141           QLU5=FRF/BW2                                                       413
142           CT5=QLU5/(W*RT5)                                                   414
143           CL2=1./(CT5*(W**2))                                                415
144           XK =ABS(AL2-CL2)                                                   416
145       525 IF(XK-DEL)530,530,520                                              417
146       530 IF(DEL-0.025E-06)540,535,540                                       418
147       535 DEL=0.01*AL2                                                       419
150           GO TO 520                                                          420
151       540 WS=2.*3.14*0.5*FRF                                                 421
152           C4=1./(AL2*(WS**2)   )                                             422
153           H4 = C4                                                            423
154           ROCIP=C4                                                           424
155           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                    425
156           C4 = ROCOP                                                         426
157           C3=C4*CT5/(C4-CT5)-(CO5+CD05)                                      427
160           H3 = C3                                                            428
161           ROCIP=C3                                                           429
162           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                    430
163           C3 = ROCOP                                                         431
164           CN=CCB6*C4/(C3+CO5+CD05)                                           432
165           HN = CN                                                            433
166           ROCIP=CN                                                           434
167           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                    435
170           CN = ROCOP                                                         436
171           WRITE(3,542)C4,C3,CN                                               437
172       542 FORMAT(1H1/////17X,10HSECTION 4.// 24X,3HSC3,9X,3HSC4,9X,3HSCN/15X 438
              1,3E12.5//)                                                        439
173           WRITE(3,545)AL2,REP5,RT5,QLU5,CT5,CL2,W5,H4,H3,HN                  440
174       545 FORMAT(/ 15X,9X,3HAL2,8X,4HREP5,9X,3HRT5,8X,4HQLU5,9X,3HCT5,9X,3HC 441
              1L2/15X,6E12.5/15X,10X,2HW5,10X,2HC4,10X,2HC3,10X,2HCN/15X,4E12.5// 442
              1)
                                                                                 500
          C                                                                      501
          C                                                                      502
          C     SECTION 5                                                        503
          C     CALCULATE AT THE RF TRANSFORMER SECONDARY STAGE(MIXER STAGE).    504
175           QLU3=FRF/BW3                                                       505
176           CT3=QLU3/(W*RT5)                                                   506
177           CL3=1./(CT3*(W**2))                                                507
200           REP3=QUUL3*W*CL3                                                   508
201           RL3=REP3*RT5/(REP3-RT5)                                            509
202           DM=SQRT(RL3/RI6)-1.                                                510
203           C5=(1.+DM)*CT3/DM
```

```
      H5 = C5                                                          511
      ROCIP=C5                                                         512
      CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                  513
      C5 = ROCOP                                                       514
      C6T=OM*C5                                                        515
      C6 =C6T-(C16+CDI6+CDSC)                                          516
      H6 = C6                                                          517
      ROCIP=C6                                                         518
      CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                  519
      C6 = ROCOP                                                       520
      QLC3=FRF/BWPTP                                                   521
      TL=20.*ALOG10(QJJL3/(QUJL3-QLC3))                                522
      FMAX2=SQRT(FT5/(8.*3.14*RBCC5))                                  523
      AMAG2=20.*ALOG10(FMAX2/FRF)                                      524
      PG5  = AMAG2-TL                                                  525
      TTGAIN= PG5  +PG6                                                526
      WRITE(3,612)C6,C5                                                527
  612 FORMAT(17X,10HSECTION 5,// 24X,3HSC6,9X,3HSC5/15X,2E12.5///)     528
      WRITE(3,620)QLU3,CT3,CL3,REP3,DM,H5,C6T,H6,QLC3,TL,FMAX2,AMAG2,PG5 529
     1,TTGAIN                                                          530
  620 FORMAT(23X,4HQLU3,9X,3HCT3,9X,3HCL3,8X,4HREP3,10X,2HDM,10X,2HC5/15 531
     1X,6E12.5//15X,9X,3HC6T,10X,2HC6,8X,4HQLC3,10X,2HTL,7X,5HFMAX2,7X,5 532
     1HAMAG2/15X,6E12.5//15X,9X,3HPG5,7X,6HTTGAIN/15X,2E12.5///)       533
C                                                                      600
C                                                                      601
C                                                                      602
C     SECTOIN 6                                                        603
C     CALCULATE AT THE INPUT MATCHING CIRCUIT.                         604
      CP=CI5 +C2                                                       605
C     RT5 = RP                                                         606
      Q =W*CP*RI5                                                      607
      RS=RI5/(1.+Q**2)                                                 608
      CS=CP*((1.+Q**2)/(Q**2))                                         609
      ACT=(C1*CS)/(C1+CS)                                              610
      QP=1./(W*ACT*RS)                                                 611
      RP1=RS*(1.+QP**2)                                                612
      CP1=ACT*((QP**2)/(1.+QP**2))                                     613
      QS =W*RBAF*CBAF                                                  614
      WRITE(3,710)CP,Q,RS,CS,ACT,RP1                                   615
  710 FORMAT(17X,10HSECTION 6,// 15X,10X,2HCP,11X,1HQ,10X,2HRS,10X,2HCS, 616
     1 19X,3HACT,9X,3HRP1/15X,6E12.5//)                                617
      RS2=RBAF/ (1.+QS**2)                                             618
      CS2 =CBAF*(1.+QS**2)/(QS**2)                                     619
      CT2=CS2*CP1/(CS2+CP1)                                            620
      AL1 =1./(CT2*(W**2))                                             621
      XL1=W*AL1-1./(W*CS2)                                             622
      BL1 =XL1/W                                                       623
      Q3 =W*BL1/RS2                                                    624
      WRITE(3,711)RS2,CS2,CT2,AL1,BL1,Q3                               625
  711 FORMAT(15X,9X,3HRS2,9X,3HCS2,9X,3HCT2,9X,3HAL1,9X,3HBL1,10X,2HQ3/ 626
     115X,6E12.5//)                                                    627
      RP3 =RS2*(1.+Q3**2)                                              628
      ALP =BL1*(1.+Q3**2)/(Q3**2)                                      629
      RA =RP3                                                          630
      RB =RP1                                                          631
      RT =RA*RB/(RA+RB)                                                632
      QL =W*CT2*RT                                                     633
      CL1=20.*ALOG10(QJJL1/(QJJL1-QL))                                 634
C     CALCULATE THE INPUT BANDWIDTH OF THE INPUT MATCHING CIRCUIT.     635
      BWI= FRF/QL                                                      636
      AB = RB/RA                                                       637
      AML1= 10.*ALOG10((1.+AB)**2/(4.*AB))
```

```
266           TLOS = CL1+AML1                                                   638
267           WRITE(3,712)RP3,RA,RB,RT,QL                                       639
270       712 FORMAT(15X,9X,3HRP3,10X,2HRA,10X,2HRB,10X,2HRT,10X,2HQL/15X,5E12.5 640
              1//)                                                              641
271           WRITE(3,715)TLOS,AML1,CL1,RWI                                     642
272       715 FORMAT(15X,8X,4HTLOS,8X,4HAML1,9X,3HCL1,9X,3HBWI/15X,4E12.5//)    643
          C                                                                     700
          C                                                                     701
          C     SECTION 7.                                                      702
          C     CALCULATE AT THE OSCILLATOR STAGE.                              703
273           WOSC=2.*3.14*FOSC                                                 704
274           CL5 =1./(5.E-12*(WOSC**2))                                        705
275           WRITE(3,800)CL5                                                   706
276       800 FORMAT(17X,10HSECTION 7.// 15X,9X,3HCL5/15X,E12.5//)              707
          C                                                                     800
          C                                                                     801
          C     SECTION. 8                                                      802
          C     PART A. DC. CALCULATION OF THE RADIO FREQUENCY AMPLIFIER.       803
277           WRITE(3,804)VCC05,VCE05,AIE05,S05                                 804
300           WRITE(3,805)VCC06,VCE06,AIE06,S06                                 805
301           WRITE(3,805)VCC07,VCE07,AIE07,S07                                 806
302       804 FORMAT(1H1////15X,28HTHE INPUT DATA OF SECTION 8.///15X,4(E12.5,1 807
              1X)//)                                                            808
303       805 FORMAT(15X,4(E12.5,1X)//)                                         809
          C     THE CENTER FREQUENCY OF CHANNEL 2. = 57.5 MHZ.                  810
304           FRF2=57.5E+06                                                     811
305           XC4=1./(2.*3.14*FRF2*C4)                                          812
          C     THE VALUE OF R3 PLUS R2 SHOULD BE.                              813
306           R3PR2=(VCC05-VCE05)/AIE05                                         814
307           R3=10.*XC4                                                        815
310           G3 = R3                                                           816
311           ROCIP=R3                                                          817
312           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                   818
313           R3 = ROCOP                                                        819
314           R2=R3PR2-R3                                                       820
315           G2 = R2                                                           821
316           ROCIP=R2                                                          822
317           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                   823
320           R2 = ROCOP                                                        824
321           PDS05=(VCC05/2.)**2/(R3+R2)                                       825
322           WRITE(3,810)R3,R2                                                 826
323       810 FORMAT(1X/////15X,34HTHE RESULT OF THE DC. CALCULATION.//24X,3HSR3 827
              1,9X,3HSR2/15X,2E12.5//)                                          828
324           WRITE(3,815)XC4,G3,G2,R3PR2,PDS05                                 829
325       815 FORMAT(15X,9X,3HXC4,10X,2HR3,10X,2HR2,7X,5HR3PR2,7X,5HPDS05/15X,5E 830
              112.5//)                                                          831
          C                                                                     832
          C                                                                     833
          C     PART B. DC. CALCULATION OF THE MIXER STAGE.                     834
326           R6=(VCC06-VCE06)/AIE06                                            835
327           G6 = R6                                                           836
330           ROCIP=R6                                                          837
331           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                   838
332           R6 = ROCOP                                                        839
333           VB06=AIE06*R6+0.3                                                 840
334           R5=R6*(S06-1.)*(1.+VB06/(VCC06-VB06))                             841
335           G5 = R5                                                           842
336           ROCIP=R5                                                          843
337           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                   844
340           R5 = ROCOP                                                        845
341           R4=((VCC06-VB06)/VB06)*R5                                         846
```

```
342             G4 = R4                                                          847
343             ROCIP=R4                                                         848
344             CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                  849
345             R4 = ROCOP                                                       850
346             PDEL=0.001                                                       851
347             PDS06=AIE06*VCE06                                                852
350             TMAX=(PRATE6-PDS06)/PDEL+25.                                     853
351             WRITE(3,820)R4,G5,G6                                             854
352       820 FORMAT(24X,3HSR4,9X,3HSR5,9X,3HSR6/15X,3E12.5/     )               855
353             WRITE(3,825)G6,VB06,G4,G5,TMAX,PDS06                             856
354       825 FORMAT(15X,10X,2HR6,8X,4HVB06,10X,2HR4,10X,2HR5,8X,4HTMAX/15X,5E12 857
          1.5/22X,5HPDS06/15X,E12.5//)                                          858
                                                                                859
      C                                                                         860
      C                                                                         861
      C     PART C. AT OSCILLATOR.                                              862
355           R10=(VCC07-VCE07)/AIE07                                           863
      C     FOR STABILITY INCRESES THE VALUE BY 1.4                             864
356           R10=1.5*R10                                                       865
357           G10= R10                                                          866
360           ROCIP=R10                                                         867
361           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                   868
362           R10= ROCOP                                                        869
363           VB07=AIE07*R10+0.3                                                870
364           R9=R10*(SQ7-1.)*(1.+VB07/(VCC07-VB07))                            871
365           G9 = R9                                                           872
366           ROCIP=R9                                                          873
367           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                   874
370           R9 = ROCOP                                                        875
371           R8=((VCC07-VB07)/VB07)*R9                                         876
372           G8 = R8                                                           877
373           ROCIP=R8                                                          878
374           CALL TNROC(ROCIP,ROCOP,VIP,OPS)                                   879
375           R8 = ROCOP                                                        880
376           WRITE(3,830)R8,R9,R10                                             881
377       830 FORMAT(24X,3HSR8,9X,3HSR9,8X,4HSR10/15X,3E12.5/     )             882
400           WRITE(3,835)G10,VB07,G9,G8                                        883
401       835 FORMAT(15X,9X,3HR10,8X,4HVB07,10X,2HR9,10X,2HR8/15X,4E12.5)       884
402           WRITE(3,840)                                                      885
403       840 FORMAT(1H1)                                                       886
404           CALL CHAIN 3                                                      887
405           STOP                                                              888
406           END
```

FORTRAN 200 SOURCE LISTING AND DIAGNOSTICS PROGRAM: ATLOG

```
001          SUBROUTINE ATLOG(X,ALOP)                                    900
           C SUBROUTINE TO FIND THE ANTILOG OF THE CALCULATION.
002          I=1                                                         901
003          IF(X.GE.0.0)GO TO 3                                         902
004          WRITE(3,2)                                                  903
005        2 FORMAT(15X,26HTHE ANSWER IS LESS THAN 1.)                   904
006          GO TO 40                                                    905
007        3 IF(X.LT.1.0)GO TO 6                                         906
010        5 I=I+1                                                       907
011          X=X-1.                                                      908
           C SET THE VALUE OF THE FIRST AND THE SECOND POINT.            909
012          IF(X.GE.1.0)GO TO 5                                         910
013        6 SP=10.                                                      911
014          FP=1.                                                       912
015       10 CP=(SP+FP)/2.                                               913
016          CP=ALOG10(CP)                                               914
           C DEVIATION OF THE CENTER RESULT AND THE INPUT DATA.          915
017          DV=ABS(CP-X)                                                916
020          IF(DV.LT.0.0001)GO TO 30                                    917
021          IF(X.GT.CP)GO TO 20                                         918
           C SET NEW POSITION.                                           919
022          SP = CP                                                     920
023          FP = FP                                                     921
024          GO TO 10                                                    922
025       20 SP = SP                                                     923
026          FP = CP                                                     924
027          GO TO 10                                                    925
030       30 ALOP = CP*10.**(I-1)                                        926
031       40 RETURN                                                      927
032          END                                                         928
```

```
FORTRAN  200        SOURCE LISTING AND DIAGNOSTICS                PROGRAM: TNROC
001              SUBROUTINE TNROC(ROCIP,ROCOP,VIP,OPS)                          929
          C      SUBROUTINE TO NORMALIZE THE INPUT R OR C.
002              COMMON IRACS(13)                                               930
003              I=1                                                            931
          C      FIND THE INDEXED POWER OF THE CAPACITANCES AND NORMALIZE THE   932
          C      INPUT VALUE.                                                   933
004              IF(ROCIP.GE.1.0)GO TO 5                                        934
005            3 I=I+1                                                          935
006              ROCIP=ROCIP*10.                                                936
007              IF(ROCIP.LT.1.0)GO TO 3                                        937
010              ROCIP=ROCIP*10.                                                938
011              VIP=ROCIP                                                      939
012              CALL CSROC(VIP,OPS)                                            940
013              ROCOP=OPS*10.**(-I)                                            941
014              GO TO 10                                                       942
015            5 I=I+1                                                          943
016              ROCIP=ROCIP/10.                                                944
017              IF(ROCIP.GE.1.0)GO TO 5                                        945
020              ROCIP=ROCIP*10.**2                                             946
021              VIP=ROCIP                                                      947
          C      NOW COMPARE THE INPUT VALUE WITH THE STANDARD SERIES.          948
022              CALL CSROC(VIP,OPS)                                            949
023              ROCOP=OPS*10.**(I-3)                                           950
024           10 RETURN                                                         951
025              END                                                            952
```

FORTRAN 200 SOURCE LISTING AND DIAGNOSTICS PROGRAM: CSROC

```
001          SUBROUTINE CSROC(VIP,OPS)                                    953
             C   SUBROUTINE TO CHOOSE THE STANDARD R OR C.                 954
002          COMMON IRACS(13)                                             955
             C   FIND THE NEAREST VALUE THAT EQUAL TO THE INPUT DATA BY    956
             C   USING BINARY SEARCH.                                      957
003          JFIV=1                                                       958
004          JLIV =13                                                     959
005          JCIV=(JFIV+JLIV)/2                                           960
             C                                                            961
             C   CHANGE FROM FIX POINT TO FLOATING POINT.                 962
006          CVS=IRACS(JCIV)                                              963
007          IF(VIP.GT.CVS)GO TO 5                                        964
010          IF(VIP.EQ.CVS)GO TO 60                                       965
             C   SET A NEW RANGE.                                         966
011          JFIV=JFIV                                                    967
012          JLIV=JCIV                                                    968
013          GO TO 10                                                     969
014        5 JFIV=JCIV                                                    970
015          JLIV=JLIV                                                    971
016       10 JCIV=(JFIV+JLIV)/2                                           972
             C                                                            973
             C   FIND A NEW RC STANDARD TO COMPARE WITH KNOWN VALUE.      974
017          CVS=IRACS(JCIV)                                              975
020          IF(VIP.GT.CVS)GO TO 15                                       976
021          IF(VIP.EQ.CVS)GO TO 60                                       977
             C                                                            978
             C   SET STARTING INDEXED VALUE.                             980
022          I=JFIV                                                       981
023          GO TO 20                                                     982
024       15 I=JCIV                                                       983
025       20 I=I+1                                                        984
             C                                                            985
             C   SET STARTING STANDARD VALUE TO COMPARE WITH VIP.         986
026          FCV=IRACS(I)                                                 987
027          IF(VIP.GT.FCV)GO TO 20                                       988
030          IF(VIP.EQ.FCV)GO TO 30                                       989
             C   FIND THE VALUE THAT RETURN BACK ONE STEP.                990
031          BOSV=IRACS(I-1)                                              991
032          CV=BOSV*SQRT(FCV/BOSV)                                       992
033          IF(VIP.GT.CV)GO TO 30                                        993
034          OPS=BOSV                                                     994
035          GO TO 50                                                     995
036       30 OPS =FCV                                                     996
037       50 RETURN                                                       997
040       60 OPS=VIP                                                      998
041          RETURN                                                       999
042          END
```

```
FORTRAN   2.0      SOURCE LISTING AND DIAGNOSTICS                PROGRAM: CMMJL
001               SUBROUTINE CMMJL(VA,VJB,VC,VJD)                              000
      C           SUBROUTINE TO MULTIPLY THE COMPLEX NUMBER.
002               VA=VA*VC-VJB*VJD                                             001
003               VJB=VA*VJD+VJB*VC                                            002
004               RETURN                                                       003
005               END                                                          004
```

```
#CHAIN,3                                                                    0000
FORTRAN  200        SOURCE LISTING AND DIAGNOSTICS                  PROGRAM: 000000
                                                                                1001
      C                                                                         1002
      C     THIRD PART.                                                         1003
      C     THE REPORT OF THE CALCULATION.                                      1004
001           COMMON IRACS(13),FRE,CBW,AIE06,VCC06,VCE06,PK6,PRATE6,FT6,RBCC  1004
             16, SO6,CD06,CD16,R16,CI6,R06,CC06,CCB6,AY11,BY11,AY12,BY12,AY21,BY2 1005
             11,AY22,BY22,AIE05,VCC05,VCE05,PK5,PRATE5,FT5,RBCC5,SO5,CD05,CD15,R 1006
             1IE,CI5,R05,C05,CCB5,AIE07,VCC07,VCE07,PK7,PRATE7,FT7,RBCC7,SO7,   1007
             1T,COSC,QUUL3,BW3,BWTP,BW2,C1,C2,RBAF,CBAF,QJUL1,QUJL2,FOSC,JH,QLC 1008
             14,FMAX,AMAG,DCL,AML,ALOS,PG6,AIL,C8,CL4,CL2,C4,CN,C3,CL3,C5,C6,AMA 1009
             1G2,TTGAIN,AL1,CL1,AML1,TLOS,BWI,CL5,R3,R2,PDS05,TMAX,R4,R5,R6,PDSO 1010
             16,R8,R9,R10                                                       1011
                                                                                1012
      C                                                                         1013
      C     THE NORMALIZING STEP.                                               1014
002           FMAX=FMAX/1.E+09                                                  1015
003           AL1=AL1*1.E+06                                                    1016
004           CL2=CL2*1.E+06                                                    1017
005           CL3=CL3*1.E+06                                                    1018
006           CL4=CL4*1.E+06                                                    1019
007           CL5=CL5*1.E+06                                                    1020
010           C3=C3*1.E+12                                                      1021
011           C4=C4*1.E+12                                                      1022
012           C5=C5*1.E+12                                                      1023
013           C6=C6*1.E+12                                                      1024
014           C8=C8*1.E+12                                                      1025
015           CN=CN*1.E+12                                                      1026
016           R2 = R2/1.E+03                                                    1027
017           R3 = R3/1.E+03                                                    1028
020           R4 = R4/1.E+03                                                    1029
021           R5 = R5/1.E+03                                                    1030
022           R6 = R6/1.E+03                                                    1031
023           R8 = R8/1.E+03                                                    1032
024           R9 = R9/1.E+03                                                    1033
025           R10=R10/1.E+03                                                    1034
026           PDS05=PDS05*1000.                                                 1035
027           PDS06=PDS06*1000.                                                 1036
030           BWI=BWI/1.E+06                                                    1037
                                                                                1038
      C     WRITE THE REPORT.                                                   1039
031           WRITE(3,777)QLC4,FMAX,AMAG,DCL,AML,ALOS,PG6,AIL,C8,CL4,CL2,C4,CN,C 1040
             13,CL3,C5,C6,AMAG2,TTGAIN,AL1,CL1,AML1,TLOS,BWI,CL5,R3,R2,PDS05,TMA 1041
             1X,R4,R5,R6,PDS06,R8,R9,R10                                        1042
032       777 FORMAT(1H1/////15X,18HTHE SECOND REPORT.//                        1043
             1   15X,54HTHE RESULT OF THE DESIGNING OF THE TELEVISION SYSTEM -// 1044
             1   15X,12H(525 LINES.)///                                         1045
             1   15X,54HPACKAGE NO.   001 TV.(THE TUNER STAGE.)              // 1046
             1   15X,54HDESIGNER.     MR. PISUT STAPORNPOORISARK.             // 1047
             1   15X,54HSOURCE TEXT. TEXAS INSTRUMENT CORPORATION.            // 1048
             1   15X,54HINSTITUTE.    CHULALONGKORN UNIVERSITY.               // 1049
             1   15X,54HWORKING DATE.FROM 10 OCTOBER 1976 TO 30  JUNE 1978.  // 1050
             1   15X,54HPROGRAM INSTRUCTOR. ASST.PROF. DR. SAWAT SAENGBANGPLA // 1051
             1              26X,45H     DIP. IN COMPUTER(D.I.I.,THE NETHERLAND):/ 1052
             1              25X,46H  CERT. IN COMPUTER TECHNIQUE(C.B.I.,ENGLAND):/ 1053
             1              25X,46H        PH.D. IN COMPUTER(LIVERPOOL,ENGLAND)// 1054
             1/)15X,10HSECTION 1.//                                             1055
             1  15X,29H          LOAD COUPLED Q   =,  2X,F8.3/                 1056
             1  15X,29H    MAX- FREQUENCY OF OSC.  =,2X,F8.3,2X,10HGIGAHERTZS/ 1057
             1  15X,29H      MAX- AVAILABLE GAIN.  =,  2X,F8.3,2X,8HDECIBEL./// 1058
```

```
     115X,10HSECTION 2./ 15X,17HLOSS CALCULATION.//                                  1058
     1  15X,29H    DIODE CONVERSION LOSS.  =,  2X,F8.3,2X,8HDECIBEL./               1059
     1  15X,29H        MISSMACH LOSS(ML).  =,  2X,F8.3,2X,8HDECIBEL./               1060
     1  15X,29H      TOTAL LOSS(SLOS).     =, 2X,F8.3,2X,8HDECIBEL./                1061
     1  15X,29HTOTAL CONVERSION GAIN(PG).  =, 2X,F8.3,2X,8HDECIBEL./                1062
     1  15X,29H      INSERTION LOSS(IL).   =, 2X,F8.3,2X,8HDECIBEL.///               1063
     115X,10HSECTION 3./ 15X,47HFIND INDUCTANCE(L4) BY USING  STEPPING               1064
     1METHOD.//                                                                      1065
     1  15X,29H          CAPACITANCE C8.   =, 2X,F8.3,2X,10HPICOFARAD./             1066
     1  15X,29H          INDUCTANCE L4.    =, 2X,F8.3,2X,10HMICROHENRY//            1067
     1/                                                                              1068
     115X,10HSECTION 4./15X,32HRADIO FREQUENCY AMPLIFIER STAGE.//                    1069
     1  15X,29H          INDUCTANCE L2.    =, 2X,F8.3,2X,10HMICROHENRY/             1070
     1  15X,29H          CAPACITANCE C4.   =, 2X,F8.3,2X,10HPICOFARAD./             1071
     1  15X,29H          CAPACITANCE CN.   =, 2X,F8.3,2X,10HPICOFARAD./             1072
     1 15X,29H          CAPACITANCE C3.   =, 2X,F8.3,2X,10HPICOFARAD.///           1073
     1///////       15X,10HSECTION 5./15X,                                           1074
     1                 38H(MIXER STAGE)RF TRANSFORMER SECONDARY.//                   1075
     1  15X,29H          INDUCTANCE L3.    =, 2X,F8.3,2X,10HMICROHENRY/             1076
     1  15X,29H          CAPACITANCE C5.   =, 2X,F8.3,2X,10HPICOFARAD./             1077
     1  15X,29H          CAPACITANCE C6.   =, 2X,F8.3,2X,10HPICOFARAD./             1078
     1  15X,29H        MAXIMUM GAIN(MAG).  =, 2X,F8.3,2X,8HDECIBEL./                1079
     1  15X,29H      TOTAL POWER GAIN.     =, 2X,F8.3,2X,8HDECIBEL.///              1080
     115X,10HSECTION 6./15X,23HINPUT MATCHING CIRCUIT.//                             1081
     1  15X,29H          INDUCTANCE L1.    =, 2X,F8.3,2X,10HMICROHENRY/             1082
     1  15X,29H              COIN LOSS.    =, 2X,F8.3,2X,8HDECIBEL./                1083
     1  15X,29H        MISSMATCH LOSS.     =, 2X,F8.3,2X,8HDECIBEL./                1084
     1  15X,29H          TOTAL LOSSES.     =, 2X,F8.3,2X,8HDECIBEL./                1085
     1  15X,29H      INPUT BANDWIDTH.      =, 2X,F8.3,2X,10HMEGAHERTZS//            1086
     1  15X,10HSECTION 7./15X,21HTHE OSCILLATOR STAGE.//                            1087
     1  15X,29H          INDUCTANCE L5.    =, 2X,F8.3,2X,10HMICROHENRY//            1088
     1  15X,10HSECTION 8./                                                          1089
     1  15X,56HPART A. DC CALCULATION AT THE RADIO FREQUENCY AMPLIFIER./            1090
     1 /15X,29H          RESISTANCE R3.    =, 2X,F8.3,2X,8HKILOOHM./                1091
     1  15X,29H          RESISTANCE R2.    =, 2X,F8.3,2X,8HKILOOHM./                1092
     1  15X,29H POWER DESSIPATION, PDS05.  =, 2X,F8.3,2X,10HMILLIWATT.//            1093
     1  15X,42HPART B. DC CALCULATION AT THE MIXER STAGE.//                         1094
     1  15X,29H  MAXIMUM TEMPERATURE TMX.  =, 2X,F8.3,2X,9HCELCIOUS./               1095
     1  15X,29H          RESISTANCE R4.    =, 2X,F8.3,2X,8HKILOOHM./                1096
     1  15X,29H          RESISTANCE R5.    =, 2X,F8.3,2X,8HKILOOHM./                1097
     1  15X,29H          RESISTANCE R6.    =, 2X,F8.3,2X,8HKILOOHM./                1098
     1  15X,29H POWER DISSIPATION, PDS06.  =,  2X,F8.3,2X,10HMILLIWATT./            1099
     1/                                                                             1100
     1  15X,47HPART C. DC CALCULATION AT THE OSCILLATOR STAGE.//                    1101
     1  15X,29H          RESISTANCE R8.    =, 2X,F8.3,2X,8HKILOOHM./                1102
     1  15X,29H          RESISTANCE R9.    =, 2X,F8.3,2X,8HKILOOHM./                1103
     1  15X,29H          RESISTANCE R10.   =, 2X,F8.3,2X,8HKILOOHM.///              1104
     1  35X,                                                                        1105
     154**************/)                                                            1106
033       WRITE(3,779)                                                             1107
034   779 FORMAT(1H1)                                                              1108
035       STOP                                                                     1109
036       END
```

*DATA 1110

OBJECT MEMORY MAP

PROGRAM/DATA AREAS	BASE LOCN DATA	BASE LOCN PROG
CHAIN 01		
UNLAB COM	04547	
LABEL COM	05743	
ACBFXP	05743	05743
ACBOIO	07173	07413
BCDCON	12072	12153
EFGCNV	15201	15201
INTCON	20355	20355
CUBCX2	21511	21511
IODIAG	21620	21620
000000	21636	32070
ACBCCH	35242	35242
	HIGHEST LOCATION	35335
CHAIN 02 (2)		
UNLAB COM	04547	
LABEL COM	06403	
ACBFPR	06403	06403
ACBFPP	06666	06666
ACBFXP	10355	10355
ACBOIO	11605	12025
BCDCON	14504	14565
EFGCNV	17613	17613
INTCON	22767	22767
CUBCX2	24123	24123
IODIAG	24232	24232
000000	24250	32432
ATLOG	52475	52777
TNROC	53751	54055
CSROC	54717	55103
CMMUL	56376	56454
ACBRTE	56723	56723
ALOG10	57726	57726
ALOG	60017	60020
SQRT	61347	61350
ABS	62077	62112
ACBFLO	62170	62170
IABS	62603	62620
ACBCCH	62730	62730
	HIGHEST LOCATION	63023
CHAIN 03 (3)		
UNLAB COM	04547	
LABEL COM	06403	
ACBFPP	06403	06403
ACBOIO	10072	10312
BCDCON	12771	13052
EFGCNV	16100	16100
CUBCX2	21254	21254
IODIAG	21363	21363
000000	21401	30214
	HIGHEST LOCATION	32060

CHANNEL 13

SPECIFICATION OF FCC TO THE TV TUNER.

RADIO FREQUENCY,(F(RF)) =	.21350E+09	HZ
CHANNEL BANDWIDTH,(BW) =	.55000E+07	HZ
IF CENTER FREQUENCY,(IF) =	.43500E+08	HZ

****

1. DATA SHEET OF TIXM06

EMITTER CURRENT,(IC) =	.20000E-02	AMPS
POWER SUPPLY VOLTAGE,(VCC) =	.12000E+02	VOLTS
COR-R TO EMI-R VOLTAGE,(VCE) =	.10000E+02	VOLTS
POWER DERATING FACTOR,(K) =	.10000E-02	WATT/C
RATED DEVICE DISSIPATION,PRATE =	.75000E-01	WATT
FREQUENCY AT 1 DB GAIN,(FT) =	.38000E+09	HZ
RBCC =	.10000E-10	PICOSECOND
STABILITY,(S) =	.30000E+01	
OUTPUT DISTRIBUTION C,(CD06) =	.15000E-11	FARAD
INPUT DISTRIBUTION C,(CDI6) =	.10000E-11	FARAD

AT IF CENTER FREQUENCY = 43.5 MHZ
WITH INPUT RF FREQUENCY =213.5 MHZ
AND OSCILLATOR FREQUENCY=257.0 MHZ

INPUT RESISTANCE(RIEP) =	.16000E+03	OHM
INPUT CAPACITANCE(CIEP) =	.70000E-11	FARAD
OUTPUT RESISTANCE(ROEP) =	.40000E+05	OHM
OUTPUT CAPACITANCE(COEP) =	.90000E-12	FARAD
C-B CAPACITANCE (CCB) =	.10000E-11	FARAD

ADMITTANCE DATA SET.

REAL PART OF Y11 =	.12000E-02	MHO
IMAGINARY PART OF Y11 =	0.00000E-99	MHO
REAL PART OF Y12 =	0.00000E-99	MHO
IMAGINARY PART OF Y12 =	-.15000E-03	MHO
REAL PART OF Y21 =	.45000E-01	MHO
IMAGINARY PART OF Y21 =	-.10000E-01	MHO
REAL PART OF Y22 =	.25000E-04	MHO
IMAGINARY PART OF Y22 =	0.00000E-99	MHO

****

2. DATA SHEET OF TIXM05

EMITTER CURRENT,(IC) =	.20000E-02	AMPS
POWER SUPPLY VOLTAGE,(VCC) =	.12000E+02	VOLTS
COR-R TO EMI-R VOLTAGE,(VCE) =	.05000E+01	VOLTS
POWER DERATING FACTOR,(K) =	.10000E-02	WATT/C
RATED DEVICE DISSIPATION,PRATE =	.75000E-01	WATT
FREQUENCY AT 1 DB GAIN,(FT) =	.45000E+09	HZ
RBCC =	.75000E-11	PICOSECOND
STABILITY,(S) =	.60000E+01	
OUTPUT DISTRIBUTION C,(CD05) =	.50000E-12	FARAD
INPUT DISTRIBUTION C,(CDI5) =	.50000E-12	FARAD

INPUT RESISTANCE(RIEP)	=	.16000E+03	OHM
INPUT CAPACITANCE(CIEP)	=	.70000E-11	FARAD
OUTPUT RESISTANCE(ROEP)	=	.10000E+05	OHM
OUTPUT CAPACITANCE(COEP)	=	.90000E-12	FARAD
C-B CAPACITANCE (CCB)	=	.10000E-11	FARAD

3. DATA SHEET OF TIXMD7

EMITTER CURRENT,(IC)	=	.20000E-02	AMPS
POWER SUPPLY VOLTAGE,(VCC)	=	.12000E+02	VOLTS
COR-R TO EMI-R VOLTAGE,(VCE)	=	.10000E+02	VOLTS
POWER DERATING FACTOR,(S)	=	.10000E-02	WATT/C
RATED DEVICE DISSIPATION,PRATE	=	.75000E-01	WATT
FREQUENCY AT 1 DB GAIN,(FT)	=	.45000E+09	HZ
RBCC	=	.75000E-11	PICOSECOND
STABILITY,(S)	=	.20000E+01	

4. THE SPECIAL DATA 1

A. AT MIXER.

AMBIENT TEMPERATURE(T)	=	.27000E+02	CENTIGRADE
CAP-CE LOAD OF OSC-R(COSC)	=	.20000E-11	FARAD
UNLOADED UNCOUPLED Q,QUUL3	=	.70000E+02	

B. AT RF AMPLIFIER.

BANDWIDTH OF SECONDARY(L3)	=	.58000E+07	HZ
BANDWIDTH PEAK TO PEAK,BWPTP	=	.60000E+07	HZ
BANDWIDTH OF PRIMARY (L2)	=	.50000E+07	HZ

C. AT INPUT MATCHING CIRCUIT.

I/P SERIE CAPACITANCE (C1)	=	.68000E-11	FARAD
I/P PA-EL CAPACITANCE (C2)	=	.18000E-10	FARAD
BALUN AND FILTER O/P R	=	.50000E+02	OHM
BALUN AND FILTER O/P C	=	.25000E-10	FARAD
UNLOADED Q OF COIL L1	=	.70000E+02	
UNLOADED Q OF COIL L2	=	.70000E+02	
OSCILLATOR FREQUENCY(FOSC)	=	.25700E+09	HZ

5. THE SPECIAL DATA 2.

THE STANDARD RESISTANCE AND CAPACITANCE SERIES.

10 12 15 18 22 27 33 39 47 56 68 82 100

****

THE SPECIAL DATA.

THE STANDARD RESISTANCE AND CAPACITANCE SERIES.

10 12 15 18 22 27 33 39 47 56 68 82 100

THE INPUT DATA OF THIS PROGRAM.

.21350E+09 .55000E+07 .43500E+08

.40000E+05 .16000E+03 .70000E-11 .90000E-12 .10000E-11

.12000E-02 0.00000E-99 0.00000E-99 -.15000E-03 .45000E-01
-.10000E-01 .25000E-04 0.00000E-99

.20000E-02 .12000E+02 .10000E+02 .10000E-02 .75000E-01
.38000E+09 .10000E-10

.45000E+09 .75000E-11

.16000E+03 .70000E-11 .10000E+05 .90000E-12 .10000E-11
.50000E-12

.70000E+02 .15000E-11 .30000E+01 .10000E-11
.27000E+02 .20000E-11

.68000E-11 .18000E-10 .50000E+02 .25000E-10 .70000E+02
.70000E+02 .25700E+09

.50000E-12 .58000E+07 .60000E+07 .50000E+07

.68000E-11 .18000E-10 .50000E+02 .25000E-10 .70000E+02
.70000E+02 .25700E+09

THE FIRST REPORT.

SECTION 1.

QLC4	FMAX	AMAG	AA	DCL	GG
•79091E+01	•12299E+10	•29028E+02	•66719E+00	•47166E+01	•12000E-02

G22	G11	AM	AL	GL
•25000E-04	•12000E-02	-•15000E-05	•69000E-05	•11000E-02

SECTION 2.

A	ALOS	AIL
•44000E+02	•10416E+02	•56996E+01

CL	AML	ANCL	Y	QUU4	PG6
•16529E+01	•40457E+01	•82644E-01	•12098E+01	•45600E+02	•18612E+02

SECTION 3

Y
•25392E+01

AMISM
•80322E+01

RLR
•49799E+04

CL4	REP	YRT	RT6	AL4
•16942E-05	•21102E+05	•27319E-03	•36604E+04	•16940E-05

CB
•55095E-11

SECTION 4.

SC3	SC4	SCN
.33000E-10	.10000E-10	.27000E-11

AL2	REP5	RT5	QLU5	CT5	CL2
.67000E-07	.62883E+04	.38606E+04	.42700E+02	.82493E-11	.67433E-07

WS	C4	C3	CN
.67039E+09	.33210E-10	.95987E-11	.28947E-11

SECTION 5.

SC6	SC5
.39000E-10	.82000E-11

QLU3	CT3	CL3	REP3	DM	C5
.36810E+02	.71114E-11	.78222E-07	.73415E+04	.61337E+01	.82708E-11

C6T	C6	QLC3	TL	FMAX2	AMAG2
.50296E-10	.40296E-10	.35583E+02	.61666E+01	.15455E+10	.17193E+02

PG5	TTGAIN
.11027E+02	.29638E+02

SECTION 6.

CP	Q	RS	C5	ACT	RP1
.25000E-10	.53631E+01	.53758E+01	.25869E-10	.53846E-11	.35743E+04

RS2	CS2	CT2	AL1	BL1	Q3
.13127E+02	.33900E-10	.46405E-11	.11987E-06	.10346E-06	.10567E+02

RP3	RA	RB	RT	QL
.14791E+04	.14791E+04	.35743E+04	.10462E+04	.65091E+01

TLO5	AML1	CL1	AW1
.16670E+01	.81923E+00	.84773E+00	.32800E+08

SECTION 7.

CL5
.76779E-07

THE INPUT DATA OF SECTION 8.

.12000E+ 2 .85000E+01 .20000E-02 .60000E+01

.12000E+02 .10000E+02 .20000E-02 .30000E+01

.12000E+02 .10000E+02 .20000E-02 .20000E+01

THE RESULT OF THE DE. CALCULATION.

SR3	SR2
.82000E+03	.10000E+04

XC4	R3	R2	R3PR2	PDS05
.83919E+02	.83919E+03	.93000E+03	.17500E+04	.19780E-01

SR4	SR5	SR6
.12000E+05	.27000E+04	.10000E+04

R6	VB05	R4	R5	TMAX
.10000E+04	.23000E+01	.11387E+05	.24742E+04	.80000E+02

PDS06
.20000E-01

SR8	SR9	SR10
.56000E+04	.22000E+04	.15000E+04

R10	VB07	R9	R8
.15000E+04	.33000E+01	.20690E+04	.58000E+04

THE SECOND REPORT.

THE RESULT OF THE DESIGNING OF THE TELEVISION SYSTEM .

(525 LINES.)

PACKAGE NO. 001 TV.(THE TUNER STAGE.)

DESIGNER. MR. PISUT STAPORNPOORISARK.

SOURCE TEXT. TEXAS INSTRUMENT CORPORATION.

INSTITUTE. CHULALONGKORN UNIVERSITY.

WORKING DATE.FROM 10 OCTOBER 1976 TO 30 JUNE 1978.

PROGRAM INSTRUCTOR. ASST.PROF. DR. SAWAT SAENGBANGPLA

DIP. IN COMPUTER(D.I.I.,THE NETHERLAND):
CERT. IN COMPUTER TECHNIQUE(C.B.I.,ENGLAND):
PH.D. IN COMPUTER(LIVERPOOL,ENGLAND):

SECTION 1.

LOAD COUPLED Q	=	7.909	
MAX. FREQUENCY OF OSC.	=	1.230	GIGAHERTZS
MAX. AVAILABLE GAIN.	=	29.028	DECIBEL.

SECTION 2.
LOSS CALCULATION.

DIODE CONVERSION LOSS.	=	4.717	DECIBEL.
MISSMACH LOSS(ML).	=	4.047	DECIBEL.
TOTAL LOSS(SLOS).	=	10.416	DECIBEL.
TOTAL CONVERSION GAIN(PG).	=	18.612	DECIBEL.
INSERTION LOSS(IL).	=	5.700	DECIBEL.

SECTION 3.
FIND INDUCTANCE(L4) BY USING STEPPING METHOD.

CAPACITANCE C8.	=	5.600	PICOFARAD.
INDUCTANCE L4.	=	1.694	MICROHENRY

SECTION 4.
RADIO FREQUENCY AMPLIFIER STAGE.

INDUCTANCE L2.	=	.067	MICROHENRY
CAPACITANCE C4.	=	33.000	PICOFARAD.
CAPACITANCE CN.	=	2.700	PICOFARAD.
CAPACITANCE C3.	=	10.000	PICOFARAD.

SECTION 5.
(MIXER STAGE)RF TRANSFORMER SECONDARY.

INDUCTANCE L3.	=	.078	MICROHENRY
CAPACITANCE C5.	=	8.200	PICOFARAD.
CAPACITANCE C6.	=	39.000	PICOFARAD.
MAXIMUM GAIN(MAG).	=	17.193	DECIBEL.
TOTAL POWER GAIN.	=	29.638	DECIBEL.

SECTION 6.
INPUT MATCHING CIRCUIT.

INDUCTANCE L1.	=	.120	MICROHENRY
COIN LOSS.	=	.848	DECIBEL.
MISSMATCH LOSS.	=	.819	DECIBEL.
TOTAL LOSSES.	=	1.667	DECIBEL.
INPUT BANDWIDTH.	=	32.800	MEGAHERTZS

SECTION 7.
THE OSCILLATOR STAGE.

INDUCTANCE L5.	=	.077	MICROHENRY

SECTION 8.
PART A. DC CALCULATION AT THE RADIO FREQUENCY AMPLIFIER.

RESISTANCE R3.	=	.820	KILOOHM.
RESISTANCE R2.	=	1.000	KILOOHM.
POWER DESSIPATION. PDS05.	=	19.780	MILLIWATT.

PART B. DC CALCULATION AT THE MIXER STAGE.

MAXIMUM TEMPERATURE TMX.	=	80.000	CELCIOUS.
RESISTANCE R4.	=	12.000	KILOOHM.
RESISTANCE R5.	=	2.700	KILOOHM.
RESISTANCE R6.	=	1.000	KILOOHM.
POWER DISSIPATION. PDS06.	=	20.000	MILLIWATT.

PART C. DC CALCULATION AT THE OSCILLATOR STAGE.

RESISTANCE R8.	=	5.600	KILOOHM.
RESISTANCE R9.	=	2.200	KILOOHM.
RESISTANCE R10.	=	1.500	KILOOHM.

****

ประวัติผู้เขียน

นายพิสุทธิ์ สถาพรภูริศักดิ์ เกิดเมื่อวันที่ 4 ธันวาคม พ.ศ.2488 ที่จังหวัดปทุมธานี สำเร็จการศึกษาชั้นปริญญาตรี สาขาวิศวกรรมไฟฟ้าจากแผนกไฟฟ้า คณะวิศวกรรมศาสตร์ จุฬาลงกรณมหาวิทยาลัย ในปีพ.ศ.2517 ขณะที่ศึกษาอยู่ได้รับทุนวิจัยเรื่อง "มาตรฐานความถี่เสียงของดนตรีไทย" จากคณะกรรมการนิสิตของคณะจำนวน 12,000 บาท ในปีพ.ศ.2512 เข้าศึกษาระดับปริญญามหาบัณฑิตในแผนกวิชาวิศวกรรมคอมพิวเตอร์ ในปีพ.ศ.2517 ขณะที่ศึกษาได้รับทุนจากสมาคมนิสิตเก่า จุฬาลงกรณ์มหาวิทยาลัย จำนวน 10,000 บาท เพื่อช่วยเหลือเป็นค่าใช้จ่ายในระหว่างการศึกษา