29/10/94.

Dear John.

I am writing to you in request for any information that you may have concerning the graphs that we sent you and also any information involving the Holy Loch.

We have just been informed that our group Cowal Monitoring Group are to share a meeting with Strathclyde Regional Council ,Strathclyde Regional Chemist and Argyll and Bute District Council and their Environmental Health Departments concerning all aspects of the Holy Loch and its surrounding area in about a months time.

This meeting will be to discuss all the problems of waste and if any other matters left behind by the U S Navy in its long stay in the Holy Loch and therefore we are looking to find all the information we can lay our hands on to deal with this important meeting as we feel that we may not get another chance to get every thing out in the open again.
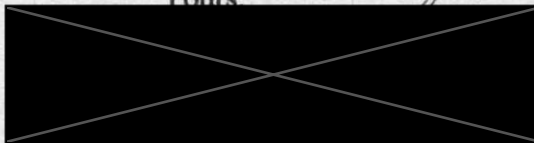
We are going to discuss the unusual peaks that have been appearing on the Argus equipment stationed here on the shores of the Holy Loch since last May to the present day to see if any one can throw some light on to or as to what could be causing the peaks to appear on the equipment.

I have enclosed a graph for most of October which could be of some interest to your group. The first two peaks are the same as most of the other ones warm sunny weather and so on next comes a much bigger peak this as you will see from the day graph is of a totally different type it came on very heavy rain from the south on a osculating cold weather front which became stationary for several hours laying the length of Britain with pulses running form the south to the north of its length while it was laying over the west coast of the U K.
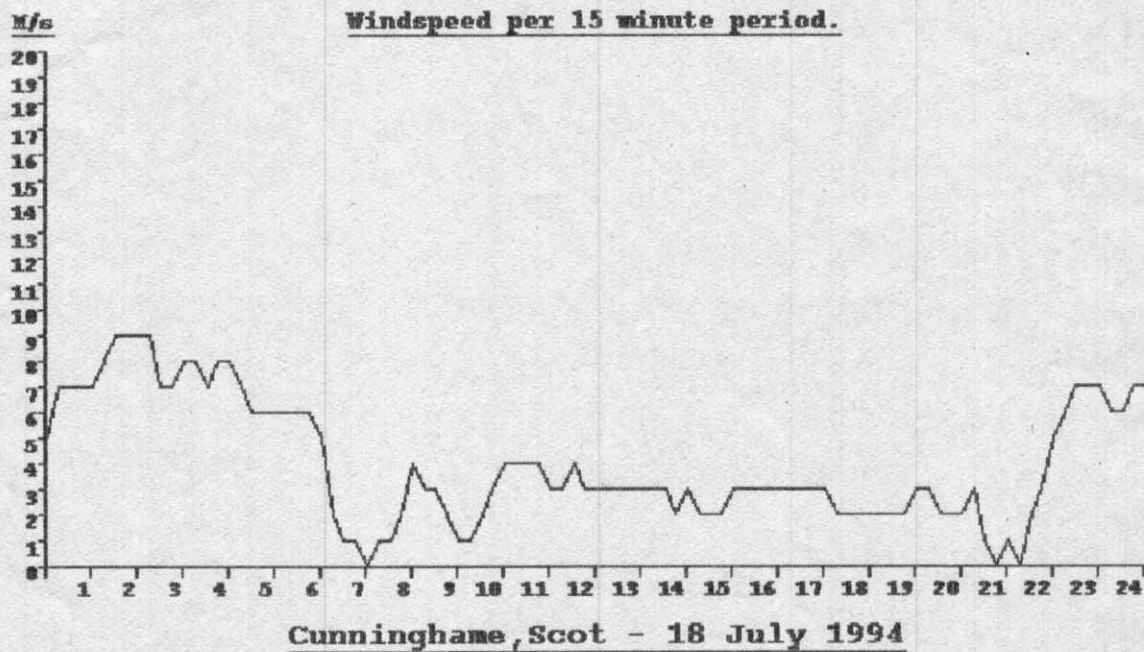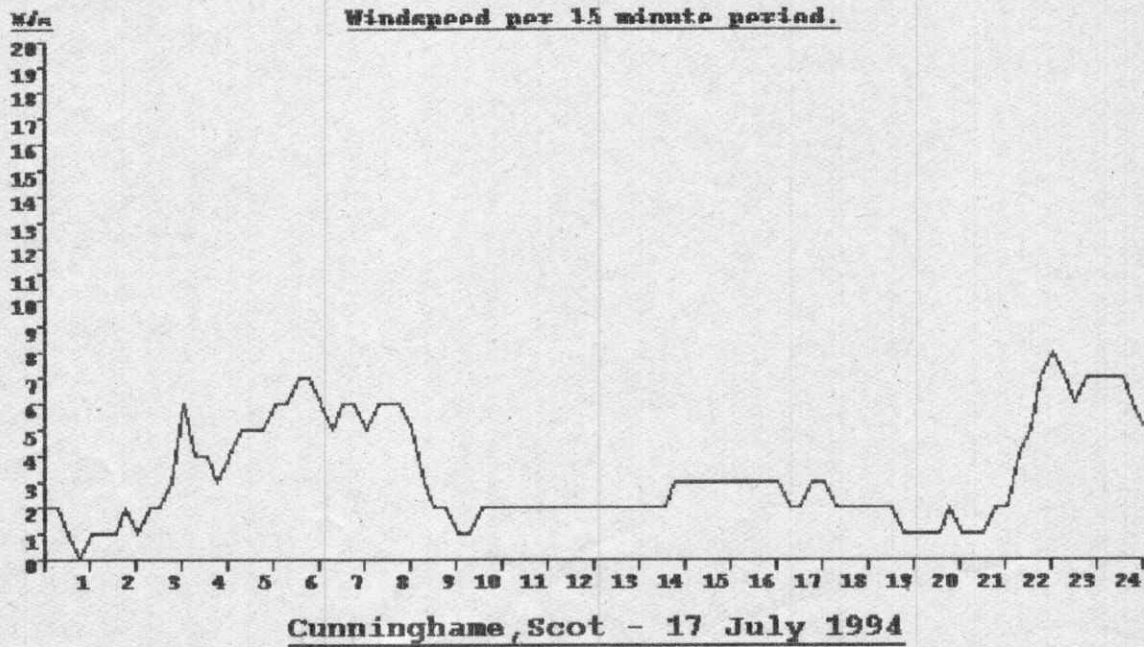
There are several smaller peaks after it and these are also due to weather conditions involving very heavy showers over several days.

I would appreciate a quick reply if possible to this letter.

Yours

Cowal Monitoring Group.

Windspeed per 15 minute period.

M/s

Cunninghame,Scot – 17 July 1994

Windspeed per 15 minute period.

M/s

Cunninghame,Scot – 18 July 1994

ARGUS DATA WEATHER FILES FOR 1994.
DATE&TIME: 17/7/94 8AM
WIND CON/AM-PM: F/C
WEATHER CON/AM: CLOUDY SUNSHINE
WEATHER CON/PM:
BAR PRE/AM-PM: 1024
TEMP/AM-PM: 13.2C
TIDES: 0602 3.2M 1904 2.9M 1216 0.6M
COMMENTS: HOLIDAYS 2 WEEKS

WE WENT ON A VISIT TO A RELITIV
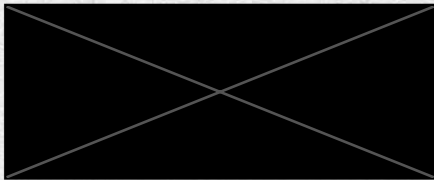FOR A WEEK WHICH LASTED 2 WEEKS
DUE HIS POOR HEALTH.
SO I COULD NOT RECORD THE
WEATHER FOR THE 18TH JULY
BUT HAVE WIND DIRECTION
GRAPHS FROM CUNNINGHAME
AND WIND STRENTH AS WELL
WHICH GIVE SOME IDEA OF
THE WEATHER FOR THE
CLYDE AREA ON THESE DAYS
RJ

10/10/94.

Dear John

　　　Please find enclosed the Graphs for the days of the
17th and the 18th I think you will find them very
interesting and if the peaks do tie in time wise then we are
almost certain as to where the peaks are coming from and
what is causing them to happen .
　　　If it dose turn out to be caused by the submarines then
it is a very big shame on the part of the Royal Navy to
release this amount of Radioactive materiel into the
atmosphere and some thing should be done to stop it being
released ..
　　　I have included a very basic weather data to go with
the graphs they could be of some use.
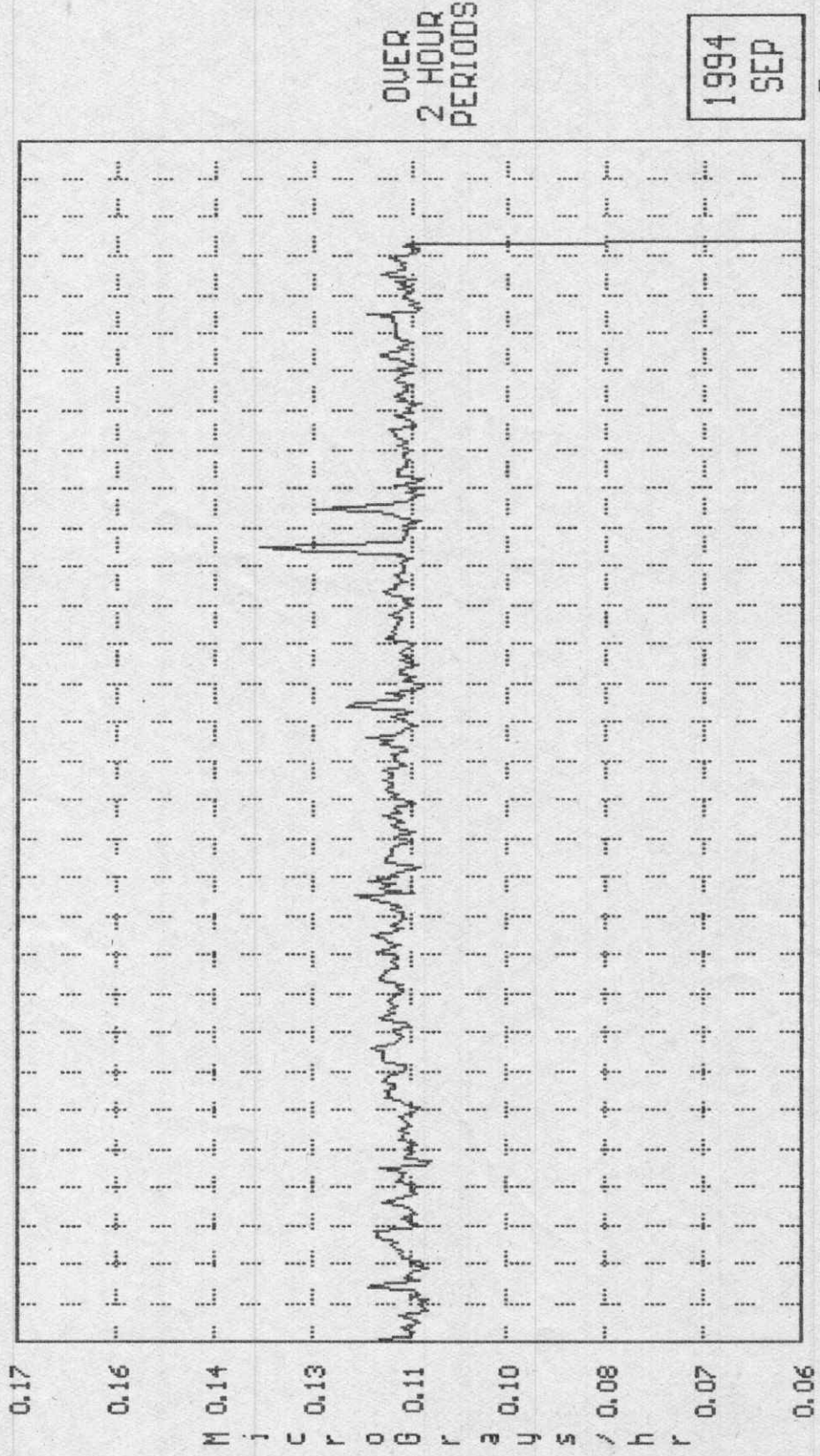　　　　　　　　　　　　　　　　　　　　Yours

Cowal Monitoring Group.

I HAVE INCLUDED BOTH RAW
DATA GRAPHS AND GOVERMENT
APROVED MICRO GRAYS

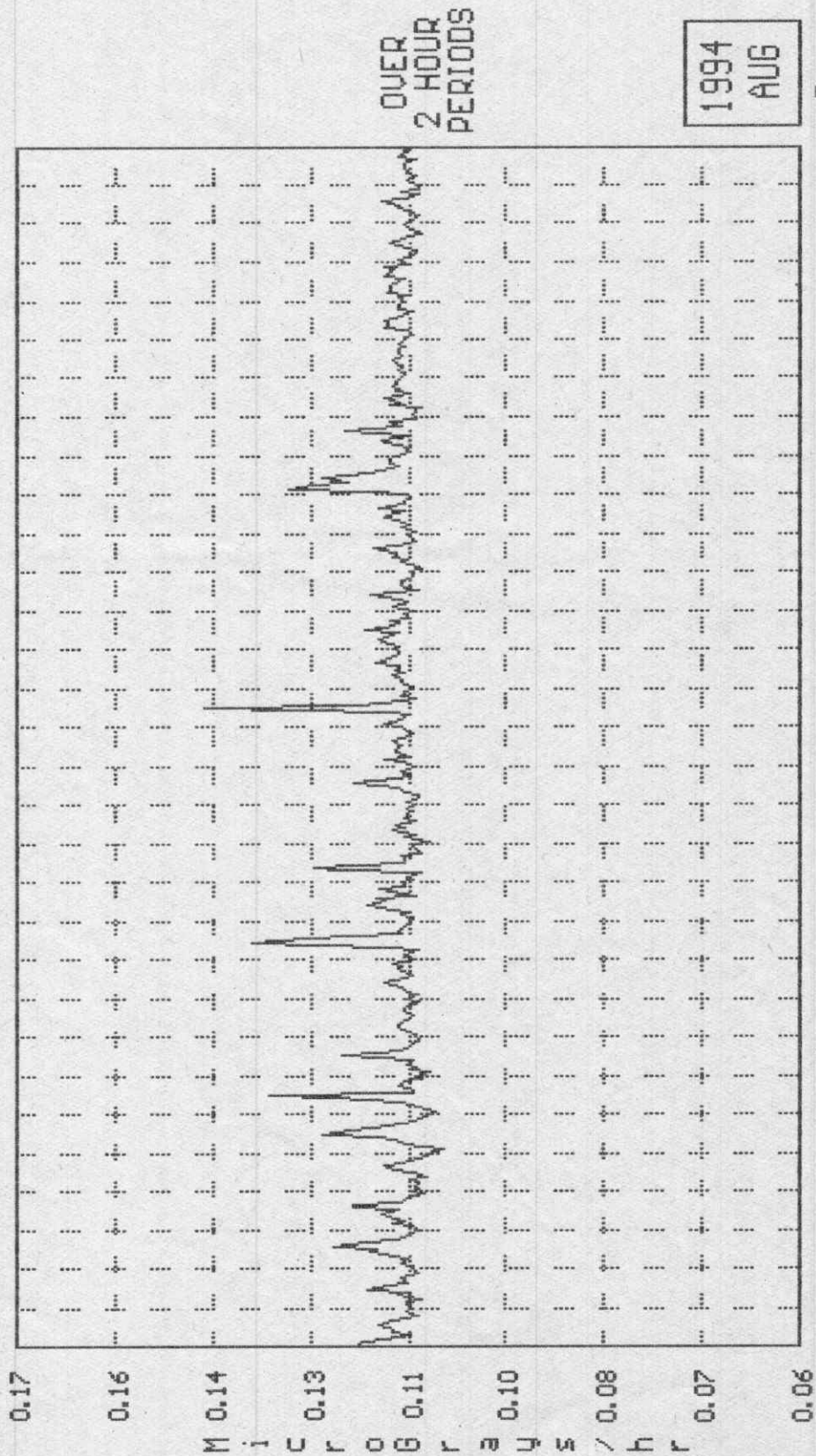ARGUS   DataView v2.1   GAMMA   GNS15800.994

Mjcror Goraysh/hr

0.17
0.16
0.14
0.13
0.11
0.10
0.08
0.07
0.06

OVER
2 HOUR
PERIODS

1994
SEP

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Days

ARGUS   DataView v2.1   GAMMA   GNS15800.894

Micro Grays / hr

0.17

0.16

0.14

0.13

0.11

0.10

0.08

0.07

0.06

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

OVER
2 HOUR
PERIODS

1994
AUG

Days

ARGUS DataView v2.1   GAMMA   GNS15800.594

DAY
13

PER 10
MINUTE
PERIODS

1994
MAY

0.17
0.16
M 0.15
i 0.14
c
r 0.14
o
G 0.13
r
a 0.12
m
y 0.12
s
/ 0.11
h
r 0.10
0.08

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hrs GMT

ARGUS   DataView v2.1   GAMMA   GNS15800.694

DAY
30

PER 10
MINUTE
PERIODS

1994
JUN

0.21

0.19   M
       i
0.17   c
       r
0.15   o
       G
0.13   r
       a
0.11   y
       s
0.08   /
       h
0.06   r

0.04

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hrs GMT
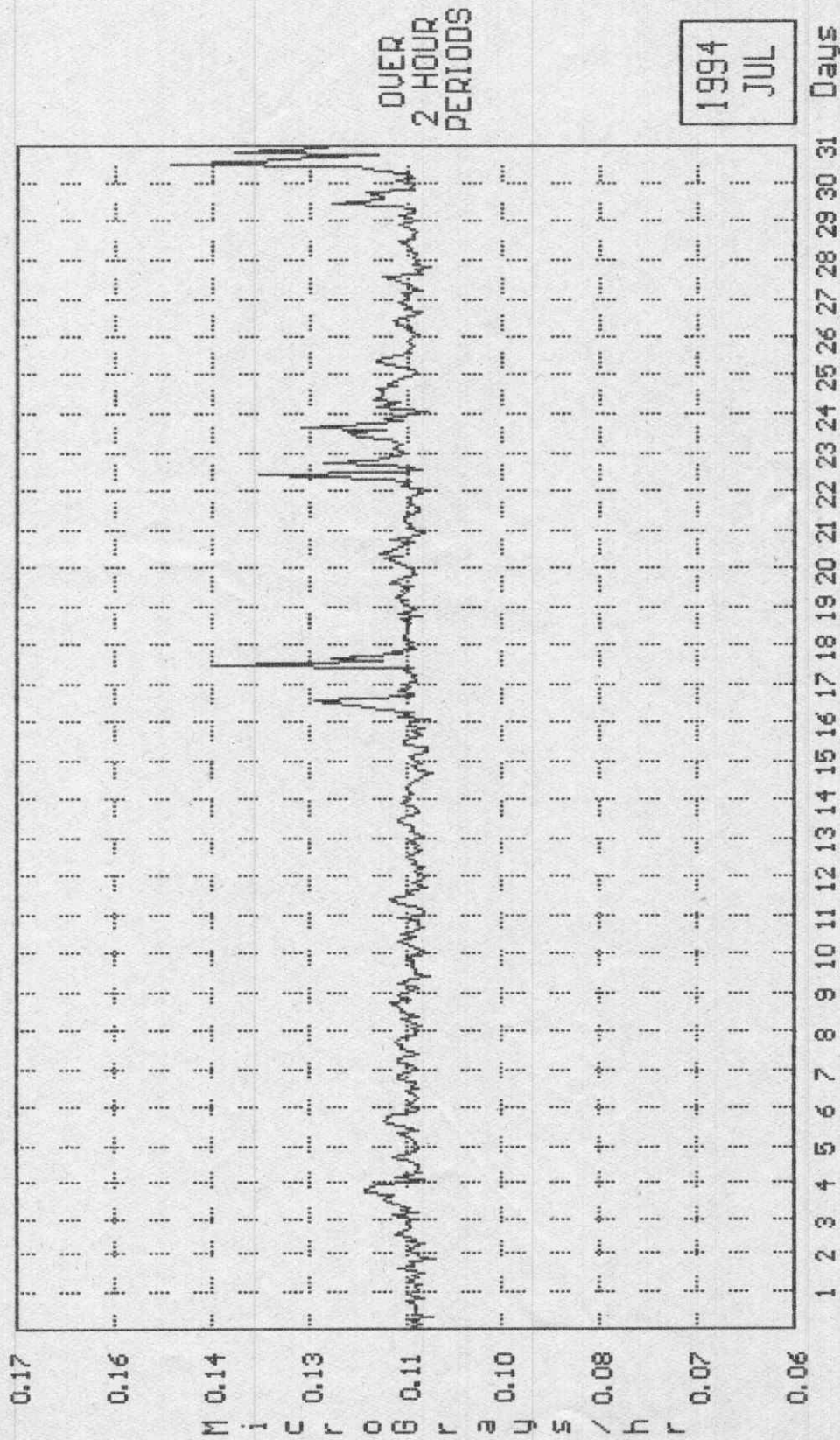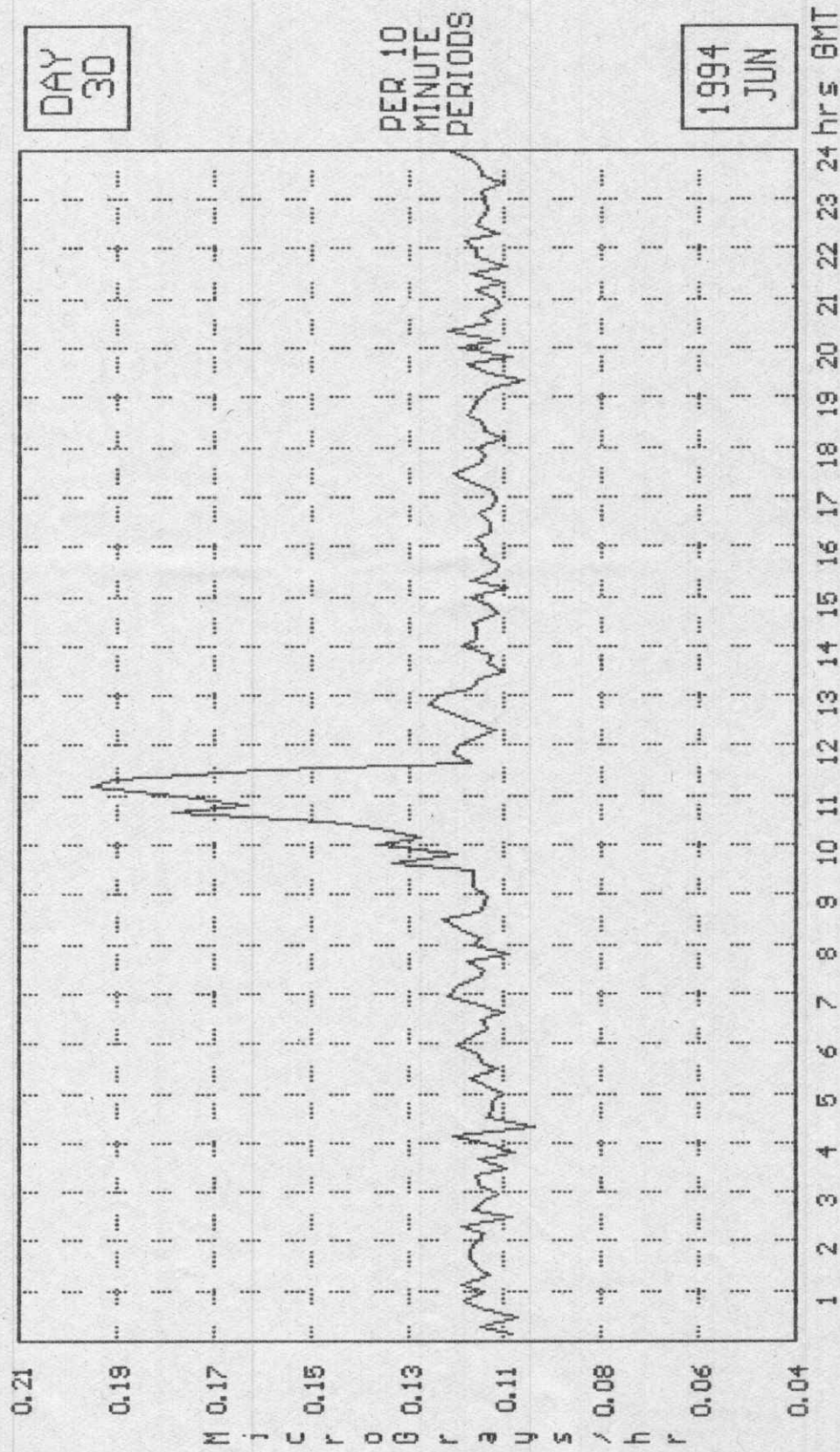
ARGUS   DataView v2.1   GAMMA   GNS15800.694

0.17

0.16

M 0.14
i
c 0.13
r
o 0.11   OVER
G   2 HOUR
r   PERIODS
a 0.10
y
s 0.08
/
h 0.07
r

0.06
    1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

                                                                1994
                                                                JUN
                                                                Days

ARGUS DataView v2.1   GAMMA   GNS15800.494
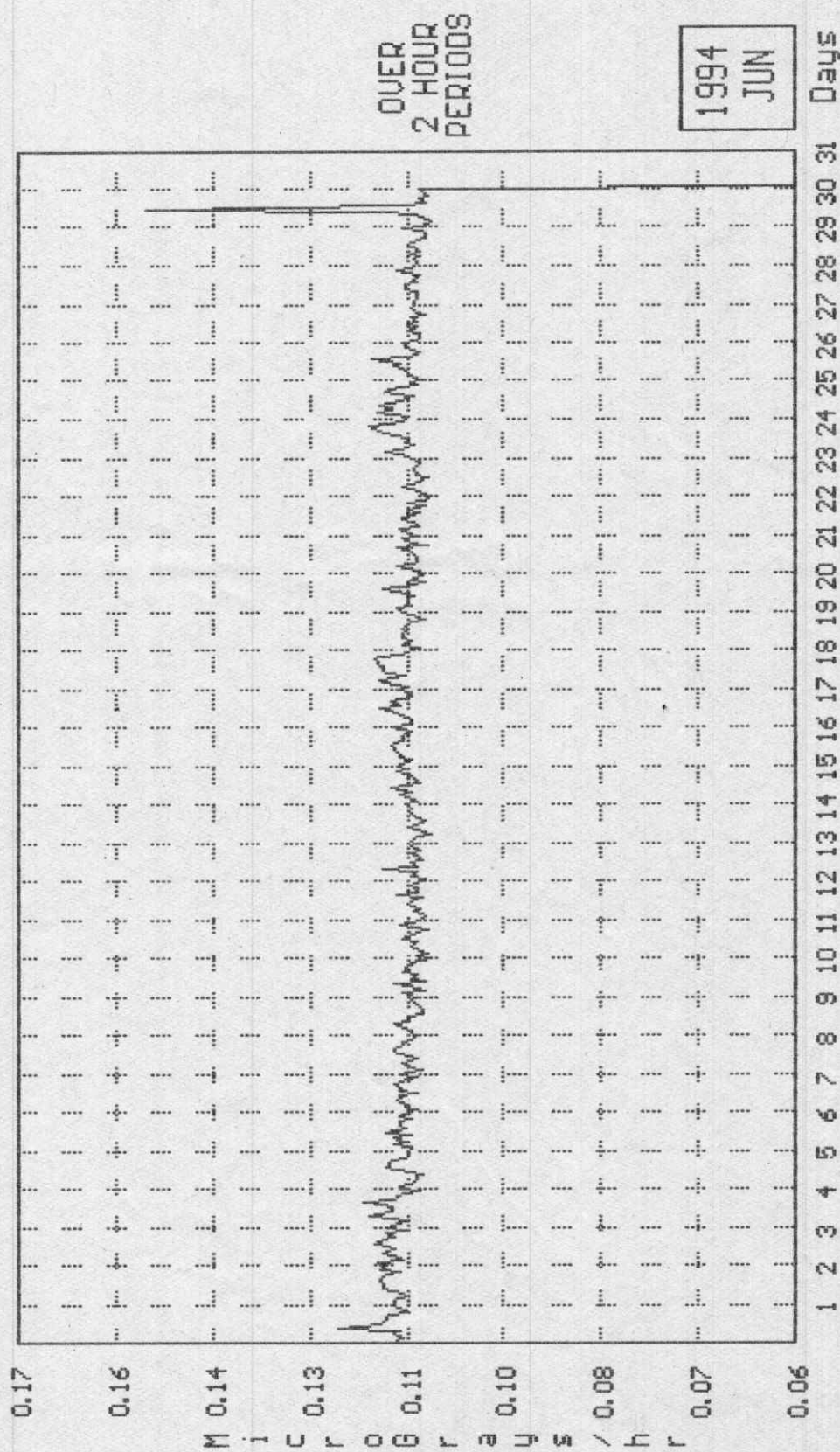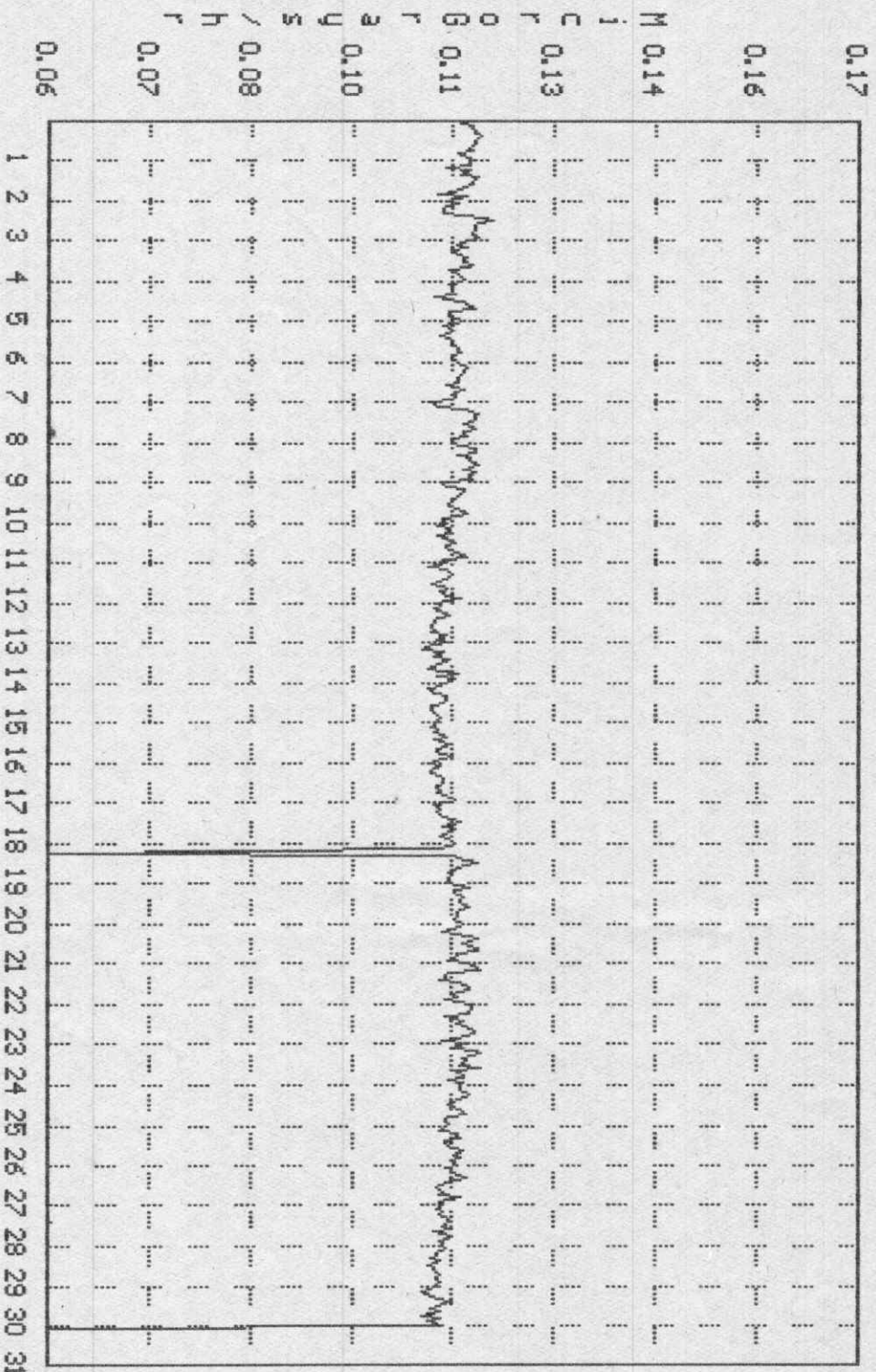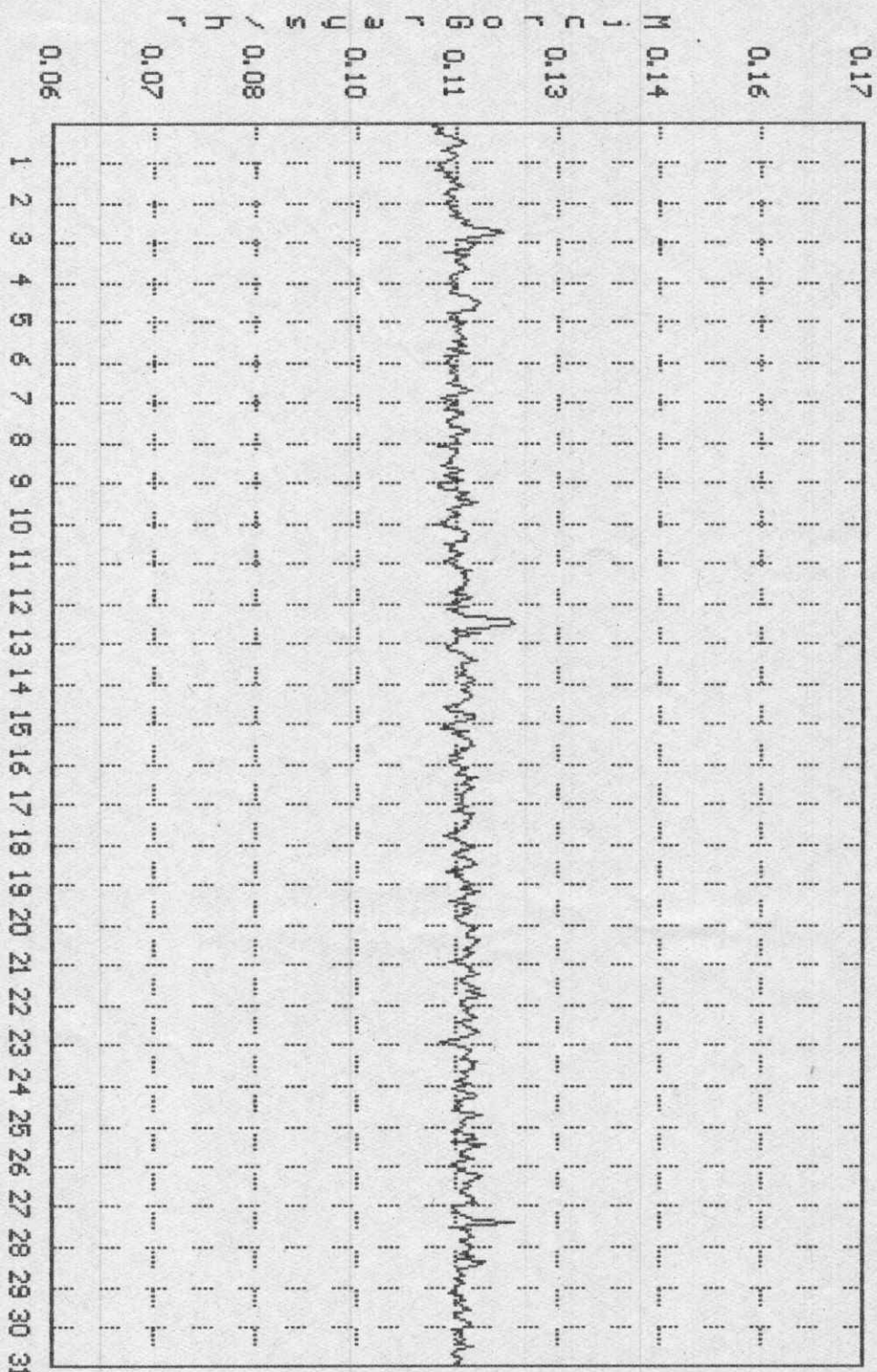
ARBUS DataView v2.1   GAMMA   GNS15800.594

MicroGrays/hr

0.17
0.16
0.14
0.13
0.11
0.10
0.08
0.07
0.06
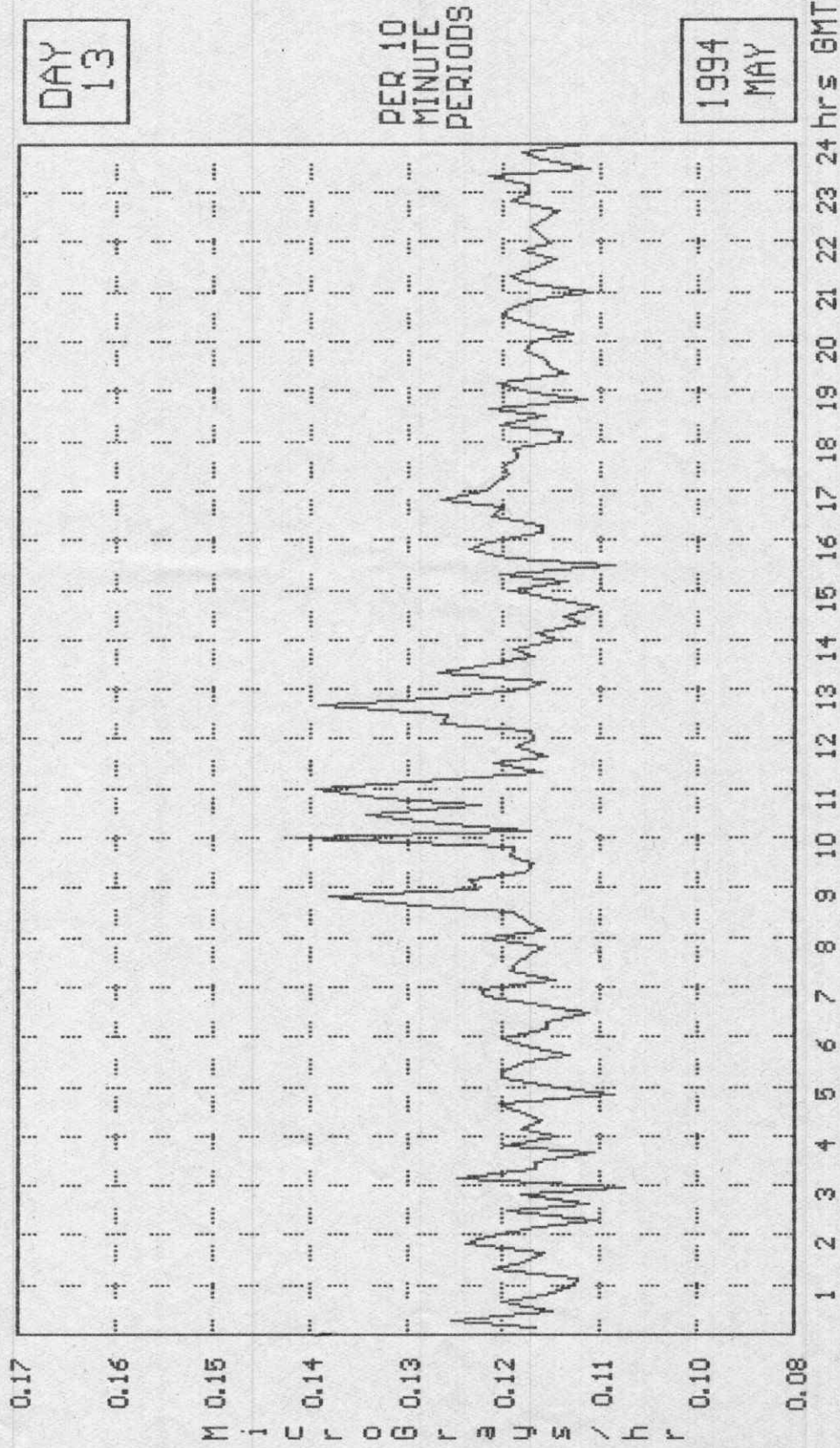
Days: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

OVER
2 HOUR
PERIODS

1994
MAY

Days
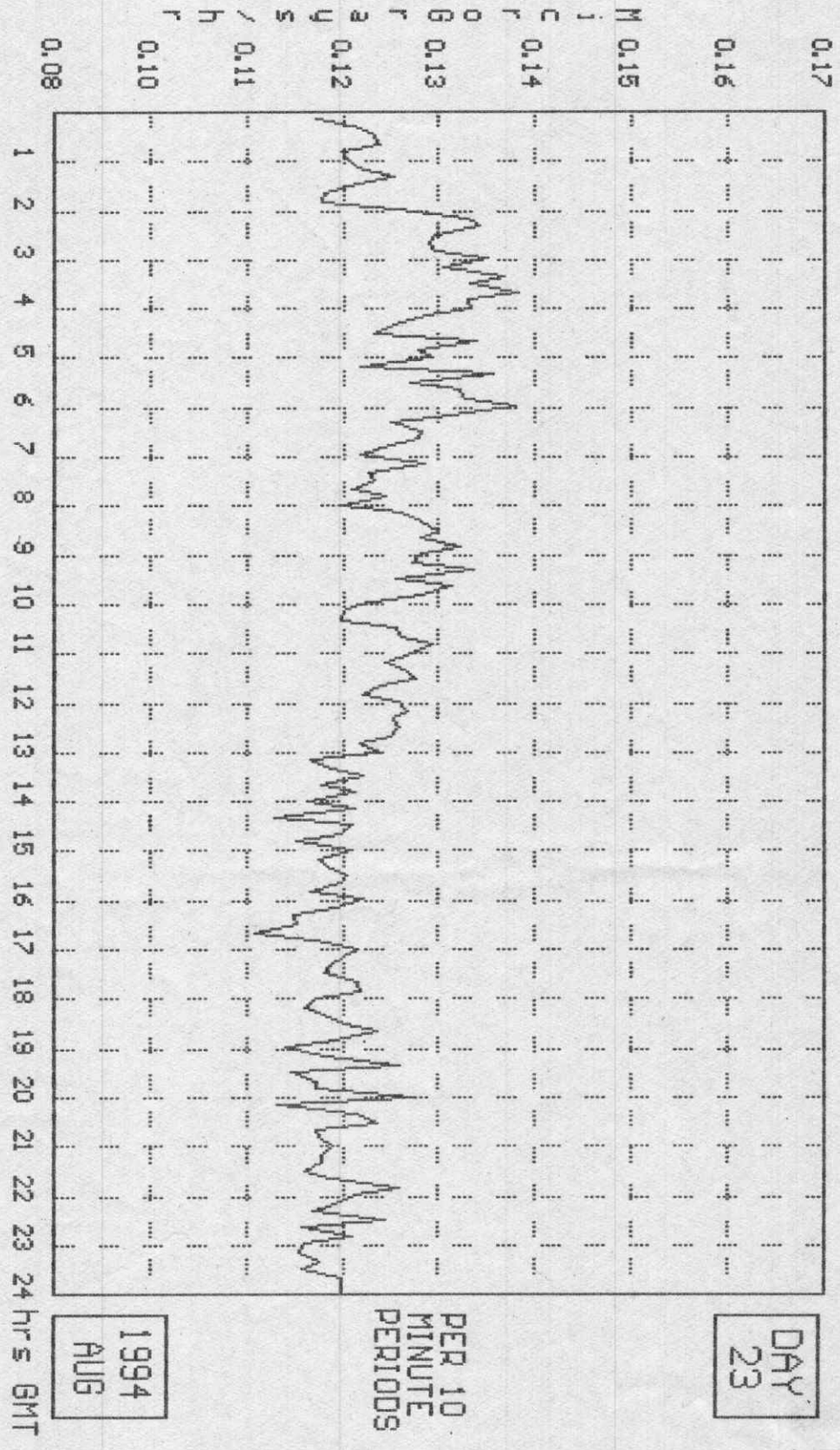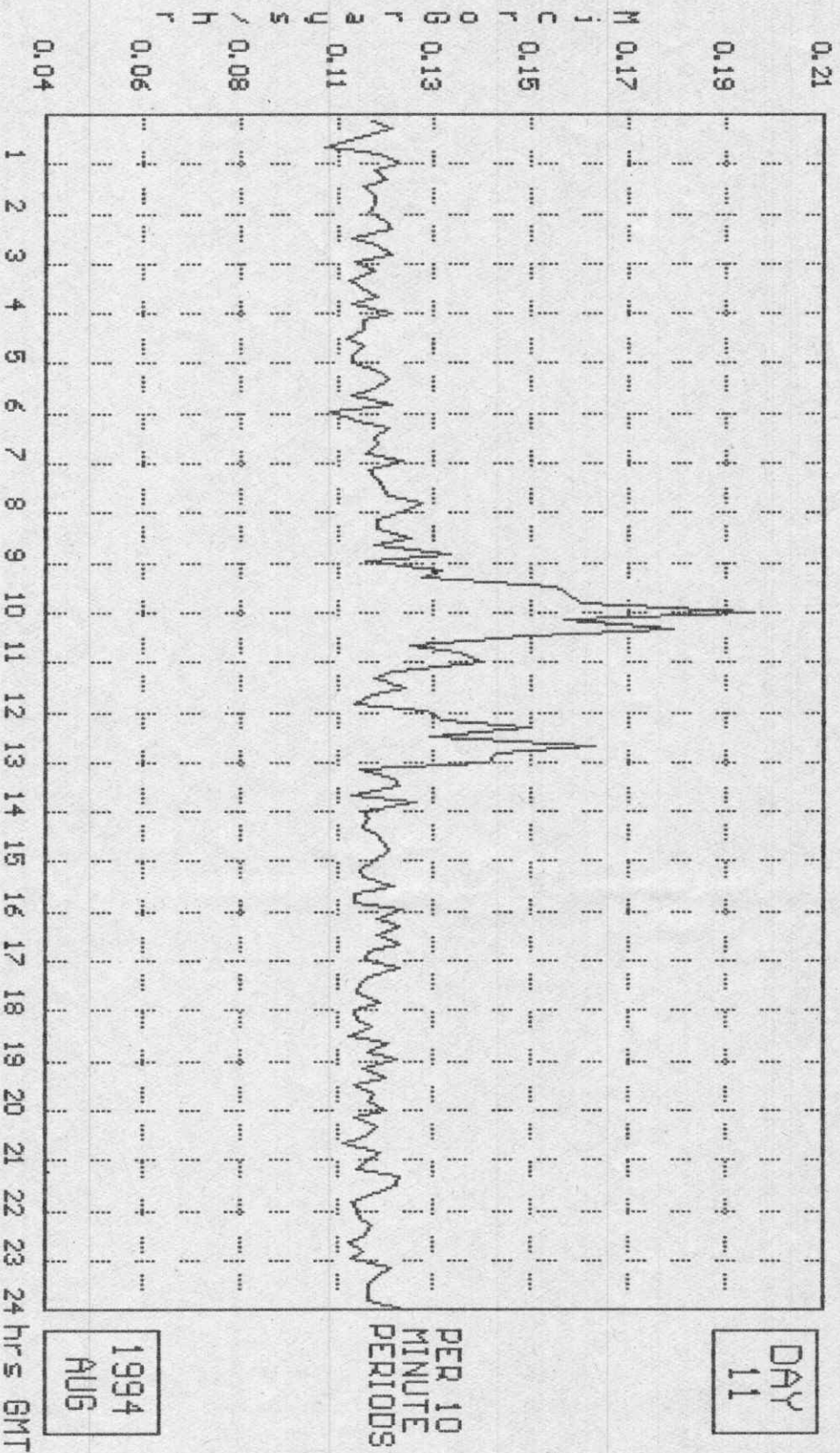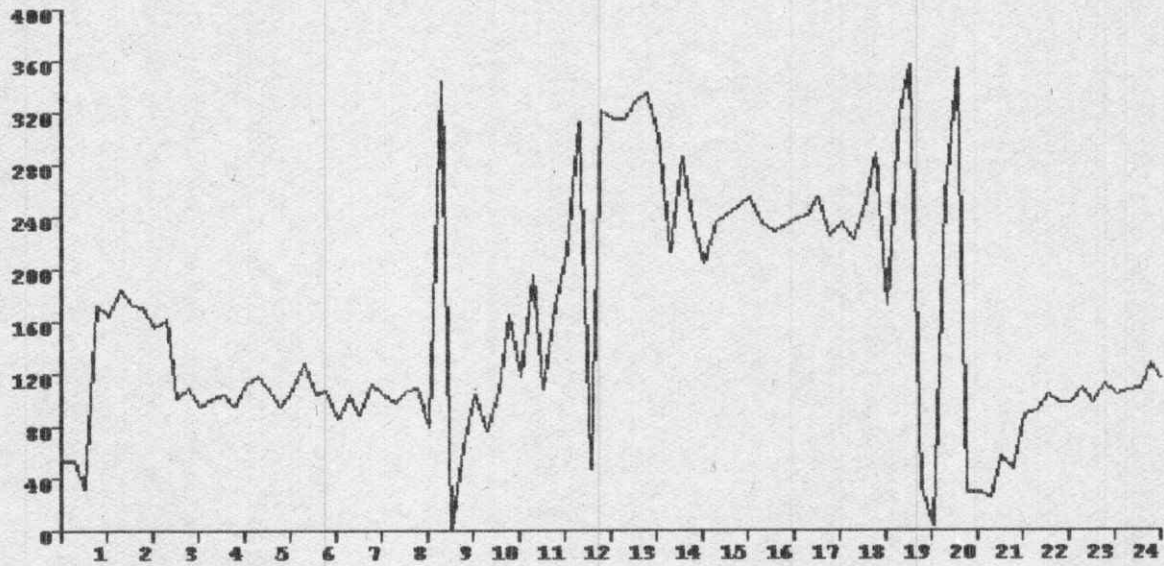
ARGUS DataView v2.1   GAMMA   GNS15800.894

DAY 23

PER 10 MINUTE PERIODS

1994 AUG

ARGUS DataView v2.1   GAMMA   GNS15800.894

DAY 11

1994 AUG

PER 10 MINUTE PERIODS

MicroGammas/hr
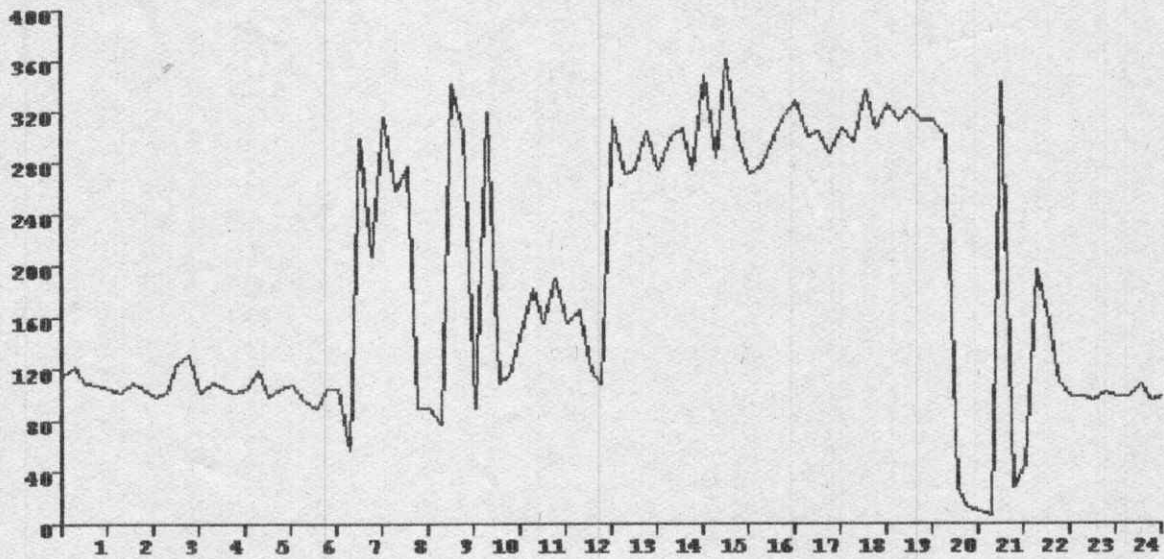
Wind Direction per 15 minute period.

Degrees

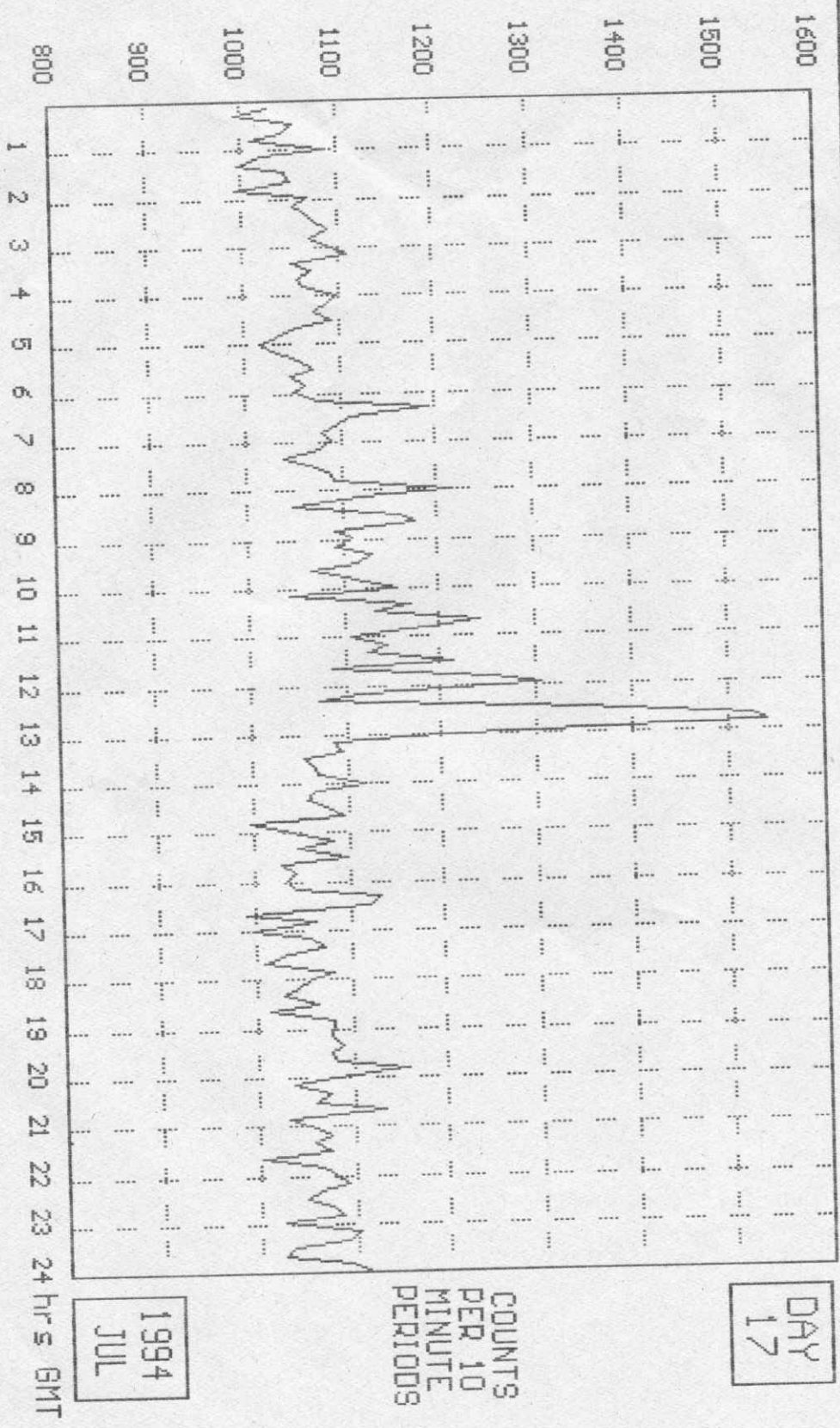Cunninghame, Scot – 17 July 1994

Wind Direction per 15 minute period.

Degrees

Cunninghame, Scot – 18 July 1994

ARGUS DataView v2.1   GAMMA   GNS15800.794

DAY 17

COUNTS PER 10 MINUTE PERIODS

1994 JUL

Y-axis (top to bottom): 1600, 1500, 1400, 1300, 1200, 1100, 1000, 900, 800

X-axis: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hrs GMT

GAMMA
17th JUL 1994

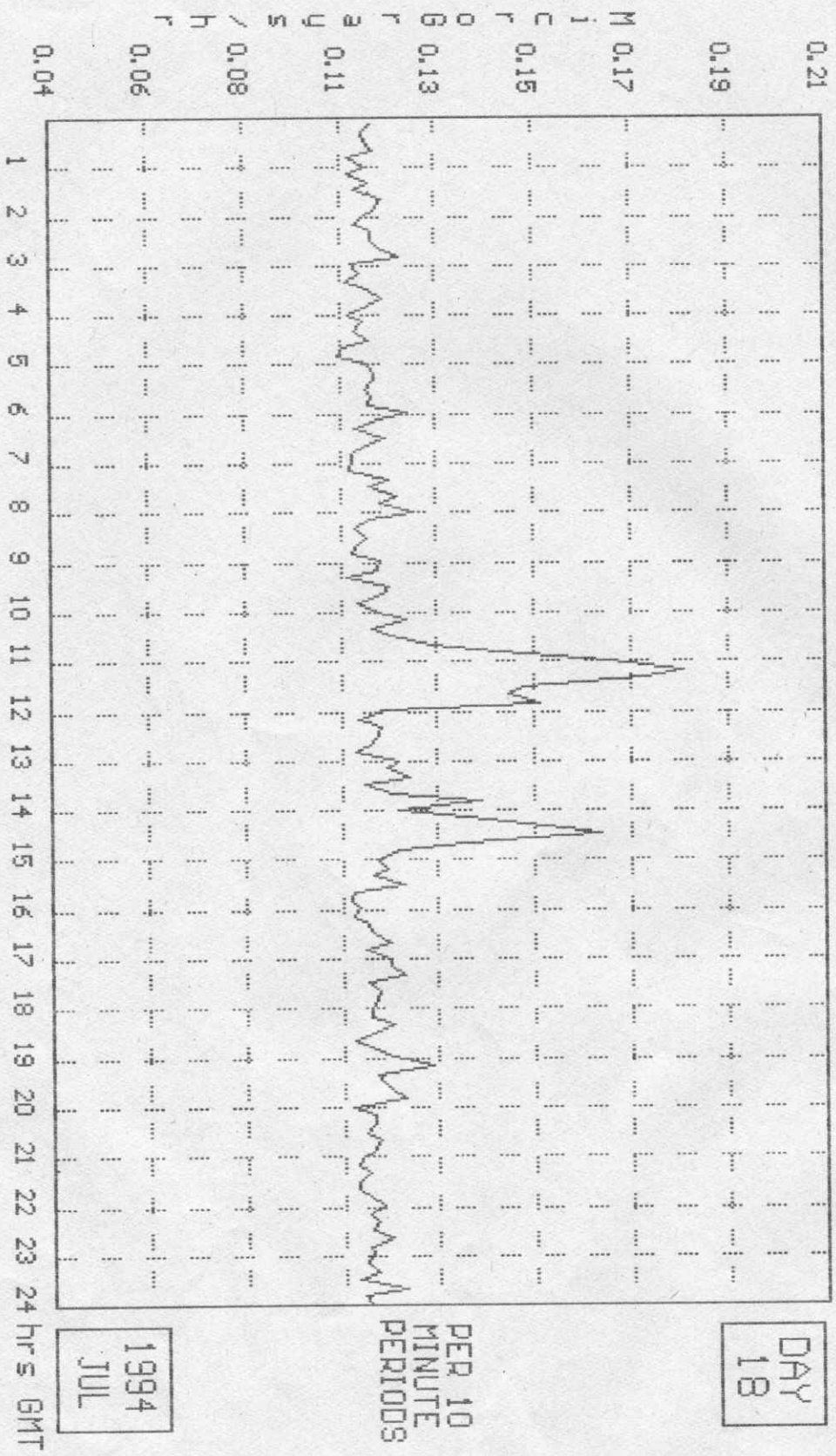Raw Counts

```
 0:00  1030   994  1054  1044  1011  1086  1024   996  1046  1052   993  106
 2:00  1054  1065  1079  1090  1072  1086  1110  1051  1073  1056  1062  109
 4:00  1089  1076  1092  1054  1036  1016  1035  1057  1041  1067  1090  121
 6:00  1075  1192  1109  1098  1082  1090  1078  1041  1114  1067  1113  115
 8:00  1117  1048  1157  1175  1093  1110  1091  1128  1213  1085  1253  130
10:00  1044  1168  1132  1240  1187  1106  1145  1123  1055  1065  1068  111
12:00  1115  1073  1347  1526  1540  1202  1086  1045  1098  1028  1043  103
14:00  1067  1058  1078  1095   997  1040  1084  1073  1036  1008  1080  105
16:00  1042  1132  1122   991  1063   998  1056  1088  1079  1083  1158  108
18:00  1042  1028  1064  1015  1082  1082  1079  1058  1075  1004  1065  107
20:00  1039  1075  1059  1131  1032  1051  1076  1091  1034  1027  1093  111
22:00  1093  1064  1049  1075  1085  1025  1104  1091  1034  1027  1093  111
```

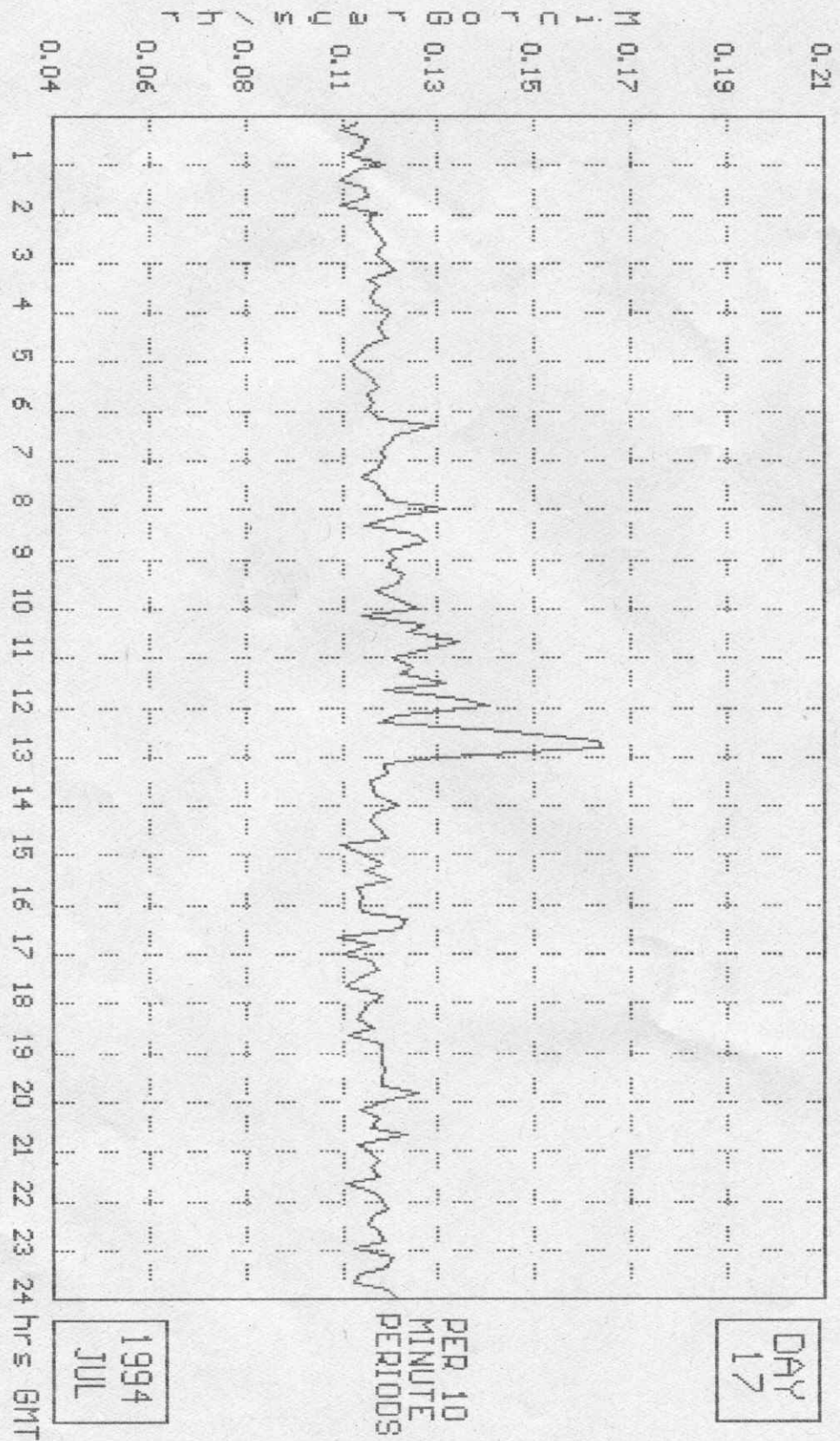The recording interval is 600 seconds

To print the raw data for a month type M, for the day type D.
: Day Graph   :   N e w   D a y   F 1 0   :   E x i t

ARGUS DataView v2.1   GAMMA   GNS15800.794

Microgravity / hours   PER 10 MINUTE PERIODS

DAY 18

1994 JUL

0.21 0.19 0.17 0.15 0.13 0.11 0.08 0.06 0.04

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hrs GMT

18th JUL 1994

MicroGrays/hr

0:00	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.11	0.11
2:00	0.11	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.12	0.11	0.11
4:00	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12
6:00	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.12	0.11	0.12	0.11	0.12
8:00	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.11	0.11
10:00	0.12	0.11	0.12	0.13	0.14	0.16	0.18	0.17	0.15	0.14	0.15	0.11
12:00	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.11	0.12	0.14	0.12
14:00	0.13	0.15	0.16	0.13	0.12	0.11	0.12	0.11	0.12	0.11	0.11	0.11
16:00	0.11	0.11	0.11	0.12	0.11	0.12	0.12	0.12	0.11	0.11	0.11	0.11
18:00	0.11	0.12	0.11	0.11	0.11	0.12	0.13	0.11	0.11	0.12	0.12	0.11
20:00	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
22:00	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.12	0.11	0.11

The recording interval is 600 seconds

To print the raw data for a month type M, for the day type D.

: Day Graph   : N e w   D a y   F 1 0 :   E x i t

MicroGravity s/hr

0.21
0.19
0.17 M
0.15 i
      c
0.13 r
      o
0.11 G
      r
      a
0.08 v
      i
0.06 t
      y
0.04 s
      /
      h
      r

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hrs GMT

PER 10 MINUTE PERIODS

DAY 17

1994 JUL

17th JUL 1994

MicroGrays/hr

0:00	0.11	0.11	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.11	O.
2:00	0.11	0.11	0.11	0.12	0.11	0.12	0.12	0.11	0.11	0.11	0.11	O.
4:00	0.12	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	O.
6:00	0.11	0.13	0.12	0.12	0.11	0.12	0.11	0.11	0.11	0.11	0.11	O.
8:00	0.12	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.12	0.12	O.
10:00	0.11	0.12	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.11	0.12	O.
12:00	0.12	0.11	0.14	0.16	0.16	0.13	0.12	0.12	0.13	0.12	0.13	O.
14:00	0.11	0.11	0.11	0.12	0.11	0.11	0.12	0.11	0.12	0.11	0.11	O.
16:00	0.11	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	O.
18:00	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.11	0.11	0.12	O.
20:00	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.12	O.
22:00	0.12	0.11	0.11	0.11	0.12	0.11	0.12	0.12	0.11	0.11	0.12	O.

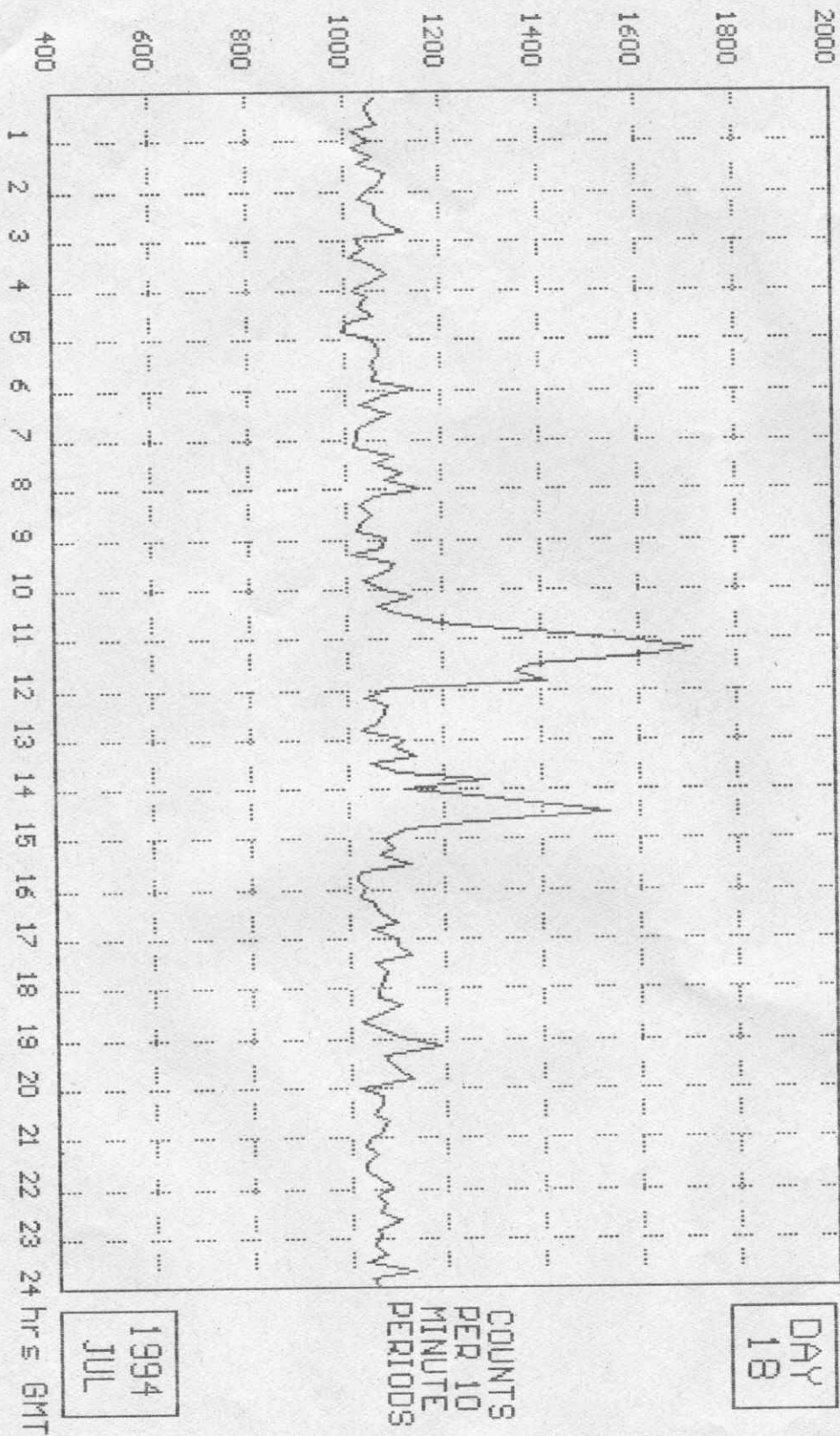The recording interval is 600 seconds
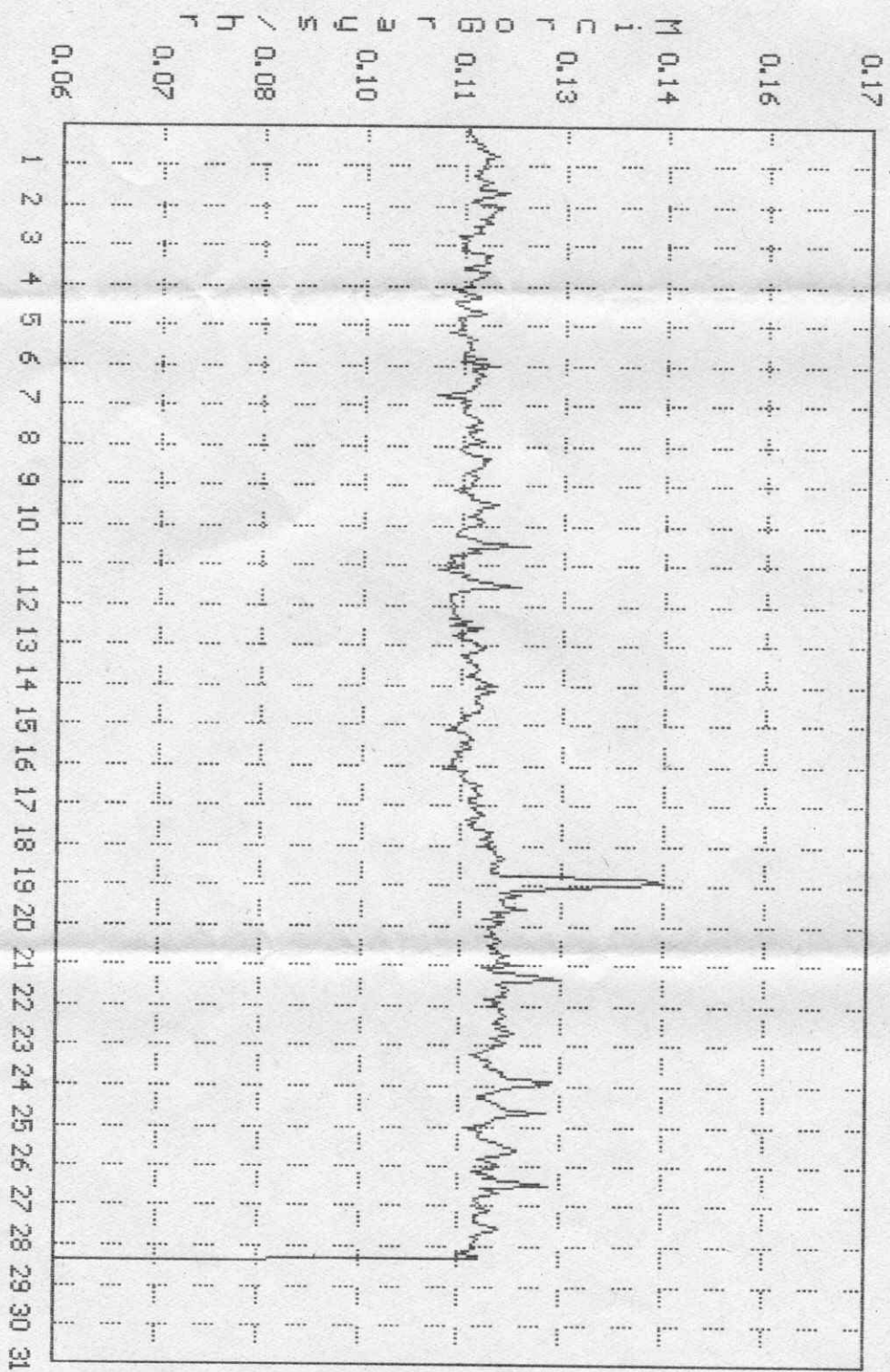

To print the raw data for a month type M, for the day type D.

: Day Graph   :   N e w   D a y   F 1 0 :   E x i t

ARGUS DataView v2.1   GAMMA   GNS15800.794

DAY 18

1994 JUL

COUNTS PER 10 MINUTE PERIODS

hrs GMT

18th JUL 1994

Raw Counts

0:00	1065	1048	1049	1072	1020	1051	1021	1058	1029	1088	1076
2:00	1028	1066	1062	1083	1122	1026	1042	1011	1056	1090	1059
4:00	1046	1030	1058	1006	996	1060	1068	1069	1050	1063	1059
6:00	1062	1029	1095	1049	1026	1022	1021	1097	1056	1118	1082
8:00	1057	1033	1053	1036	1024	1083	1076	1014	1100	1087	1039
10:00	1132	1062	1103	1188	1327	1554	1707	1626	1375	1349	1407
12:00	1039	1079	1074	1058	1029	1117	1094	1138	1048	1103	1286
14:00	1258	1420	1535	1254	1117	1067	1091	1065	1126	1026	1018
16:00	1024	1054	1066	1096	1045	1101	1096	1124	1054	1075	1069
18:00	1058	1106	1055	1022	1064	1102	1186	1067	1082	1103	1127
20:00	1063	1061	1048	1074	1061	1041	1031	1049	1030	1033	1055
22:00	1050	1072	1056	1099	1053	1059	1047	1071	1028	1126	1040

The recording interval is 600 seconds

To print the raw data for a month type M, for the day type D.

: Day Graph   :   N e w   D a y   F 1 0   :   E x i t
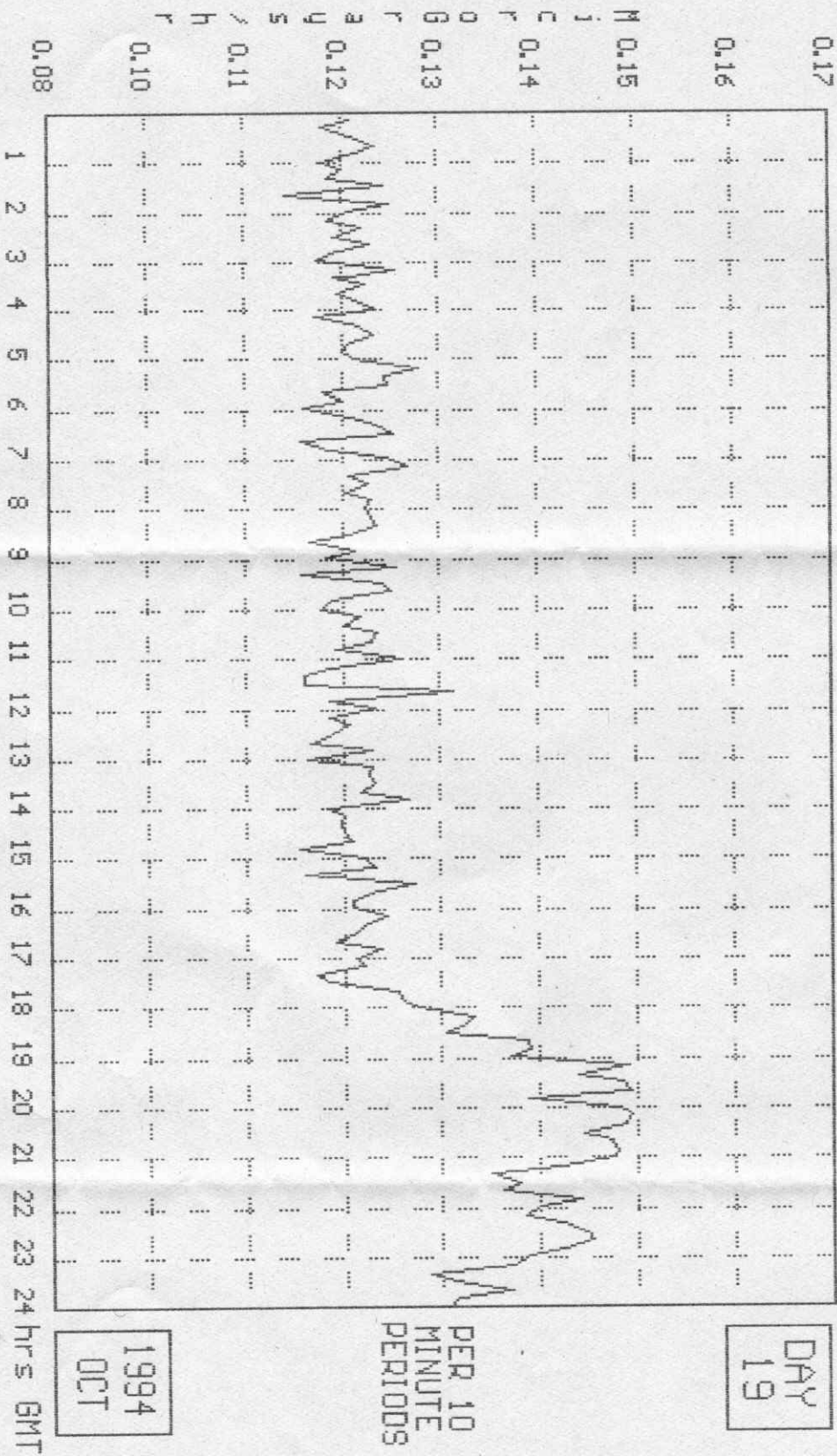
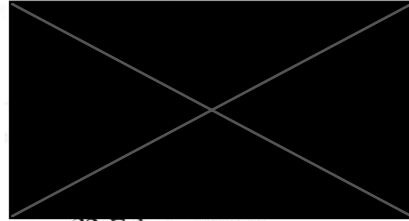ARGUS DataView v2.1   GAMMA   GNS15800.094

Microrays / hr

0.17
0.16
0.14
0.13
0.11
0.10
0.08
0.07
0.06

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 Days

OVER 2 HOUR PERIODS

1994 OCT

ARGUS DataView v2.1   GAMMA   GNS15800.094

DAY 19

1994 OCT

PER 10 MINUTE PERIODS

24 hrs GMT

MjcrorGosjuaryshr

22 Februry 2000

John Ainslie
Administrator
Scottish Campaign for Nuclear Disarmament
15 Barrland Street
Glasgow G41 1QH

Dear John

Nuclear Report concerning HM Naval Base Clyde Faslane.

Thank you for your letter dated 8 December, 1999, in which you state, that you will be getting in touch with the H.S.E, about secondary monitoring at Faslane. After waiting more than 2 months, I had to phone you on the 17 february, 2000, to find out what was happening.

This didn t surprise me, as I have had to do this, since you first replied to me on the 11 October, 1998, I had to phone you, to get you to reply to me when I first sent you my Nuclear Report, In fact you would also not have written to H.S.E. until I pressed you to do something ?

What you must consider, is that I had to pluck up the courage to write C.N.D. such is there reputation, but after dealing with you , I feel badly let down.

Therefore I would apprecitate, If you would forward on to your head office, my Nuclear Report, to acertain if they feel the same way about it as you do.
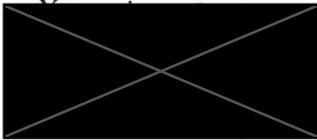
cc Mr Tony Benn

Dear ✕✕✕   26/7/92

Thank you for your letter which was very helpful. I have now written to
SCRAM and asked them to discuss the whole business with me. My thinking
was that Scottish CND and SCRAM could jointly put together a set of ideas
about how to improve monitoring radiation in Scotland and then make joint
approaches to the local authorities. Taking into account what you have
said, it seems to me that a network of ARGOS monitors which were sited near
all significant nuclear installations in Scotland would provide an
independent albeit crude monitoring network. Assuming the data was also
shared by the local authority it could be the basis for the local authority
doing additional checks if they had the equipment and expertise available.
The problem may be that some authorities do not have either where others
are already doing routine sophisticated tests. It would certainly be
unsatisfactory if the ARGOS network was considered enough on its own.
Therefore any proposal would also have to stress the need for additional
more sophisticated checks to continue or start to be done routinely in some
areas and to be done 'as and when' in others. You would have as good an
idea as anyone about the where and when what should be done.

A first step is to be clear about exactly what is done at the moment by
local authorities. I know that the Forth and the Clyde are both routinely
monitored but still have a lot to find out. Do you want to be involved in
further discussions about this? You are an expert in this area and I do
not know at the moment whether there is anyone in SCRAM in this position.
If you were prepared to be involved in a future discussion I would be happy
to make sure a time and place was chosed to make this possible for you.

Thanks again.

                                     ✕✕✕

SCOTTISH CAMPAIGN FOR NUCLEAR DISARMAMENT

copy

SCOTTISH CND

420 Sauchiehall Street,
Glasgow G2 3JD.

TEL: 041-331 2878

note new address 6 Dalcross Pass, Glasgow G11 5RA, 041-339 4844
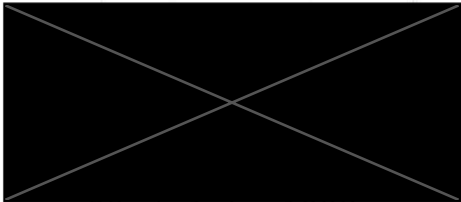from ~~XXXX~~ 1 Warrender Park Crescent, Edinburgh EH9 1DX, 229 0029
work 650 4002

Dear SCRAM,   26/7/92

I am writing because I would like us, Scottish CND and SCRAM, to discuss
the issue of monitoring radiation. An obvious end to work towards is a
more elaborate network of monitoring than at present, with particular
attention given to all sites connected to nuclear business, both civil and
military. I have been doing a bit of finding out about the ARGOS network
and some information and an assessment of it from an appropriately
qualified scientist who lives near Rosyth is enclosed. At the moment the
only ARGOS network point in Scotland is in Dunoon run by Sally and Richard
Taylor, Cowal Monitoring Group and I believe it was funded by the local
authority. I do not doubt that Scottish CND can find appropriate people to
'house' monitors near every nuclear installation in Scotland and it would
be possible to make an approach to both individual local authorities and
local authorities collectively through the Scottish Nuclear Free Zones
Committee. However the ARGOS system has limitations and would not be
sufficient alone.   I would like to discuss the whole business of what
monitoring is done at present, what the ideal would be and how to get there
with you before going any further. Could you suggest a time I might come
down to your office?

You should by now have been approached to ask if you would like a stall at
our AGM at Clydebank on 12 and 13th September. I do hope you will have a
presence there. Our programme is not yet absolutely fixed but a number of
issues of common concern will certianly come up including the
transportation of nuclear materials.

                    Yours sincerely,

                    ~~XXXX~~
                    Joint Secretary

22nd July 1992.

Dear ■

     Sorry not to have got back to you sooner, (although I did phone you one evening). The problem is I'm not quite sure what to tell you.

     I don't think there is anything wrong with the Argus project, but I think it is important before embarking on a project like this, to be very clear about what exactly you hope to achieve. It may be that this system is the most appropriate or it could be with a little research that something else could be found to be better.

     The Argus is a pretty basic detection probe with a sophisticated means of logging the results. It could pick up radiological contamination fairly quickly since results are collated every 24 hours, but it couldn't tell you what was causing the problem so easily or what isotopes were present. As the results from Dunoon show even stormy weather can cause marked increases in radioactivity (due to beryllium being washed out of the atmosphere) - which could be confusing.

     The results sent to you didn't have statistical margins of error but I suspect the various peaks were mostly normal variations. In order to detect atmospheric contamination with a geiger counter you would need to have a fairly large problem. One way round this is to use a system that pumps air through a filter and thereby concentrates any radioactivity present or to analyse biological materials which naturally concentrate particlar radionuclides.

     If increased levels of radioactivity were found to be present it would almost certainly be necessary to have more detailed analysis done. I think it would be interesting to find out what local authoities in the area are doing, some environmental health department are fairly progressive and I know the Lothian analyst bought fairly sophisticated equipment a few years ago.

     As to siting the equipment if you decide to go ahead, we would not be opposed to having it in our garden, however I'm not sure the site would be open enough and it would have to be Lachlan proof (1 year old).

     Before going ahead I think it would be sensible to have detailed discussions about the system with someone, I'd be happy to help if you thought it would be useful.

I maybe sound a bit negative about the system but I think it is important to know what it can and can't do. One of the main advantages with the system is that it all gets set up for you and somme analysis is done for you. The fact that it is linked up with other systems throughout Britain improves the statistical significance of the results and could help with the analysis of the source of pollution.

Hope this is of some help, please get back in touch if you want me to explain any of my comments more fully.
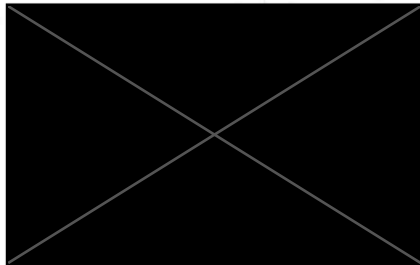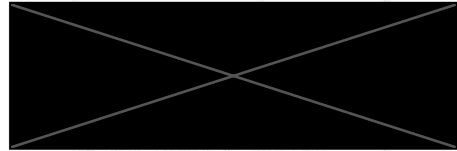
Dear Lynn

After my wife Sally met you at the Conference in Glasgow she asked me to send you some information concerning the Argus Project.

Basicly we have been running the argus station in Sandbank for just over two years collecting Gamma Radiation counts. As you can see from the brochures it consists of a geiger tube mounted outside a house with a cable leading into a data logging control unit which is connected to a telephone line and on to a computer. We have our own computer connected to the argus and as we are part of the argus network this gives us access to all the other argus stations "ie" we can study all the argus graphs from all over Britain . We feel that you need a computer to gain a full benefit of the argus and the argus people have made the system to be used with a very basic computer. Ours is an Amstrad 1640 with a 32 megabyte hard drive this gives us the capacity store up to a years information . The cost of an Argus station is about £1500 plus vat.A computer and printer would be of your own choice but if you already have a computer working in MS DOS then all that would be required is a cable to connect it up to the Argus Control unit.

We have found the argus to be a very sensitive instrument and after running it for some time have gained a full understanding of it. I have enclosed some graphs showing some recent thunder storm activity and a large weather front that came through in January.This peak in January and several others like it has led the Argus Trust to study these peaks in great detail and have noticed that when studying Acid Rain the acidity levels increased with the Gamma levels and this has lead to the Argus people to develop an Acid Rain Monitor running twenty four hours a day all the time and is connected up to run in hand with the Gamma station using the same computer to monitor it. This monitor cost about £5000 but there is alot of interest in it and several are being built at the moment.

Next I have enclosed two photos showing the Explosives handling jetty and a Polaris submarine loading/unloading a missile at Coulport.

I hope this information will be of use to you as we feel that an Argus station installed on the East coast would be of a great benefit to you in monitoring your area.
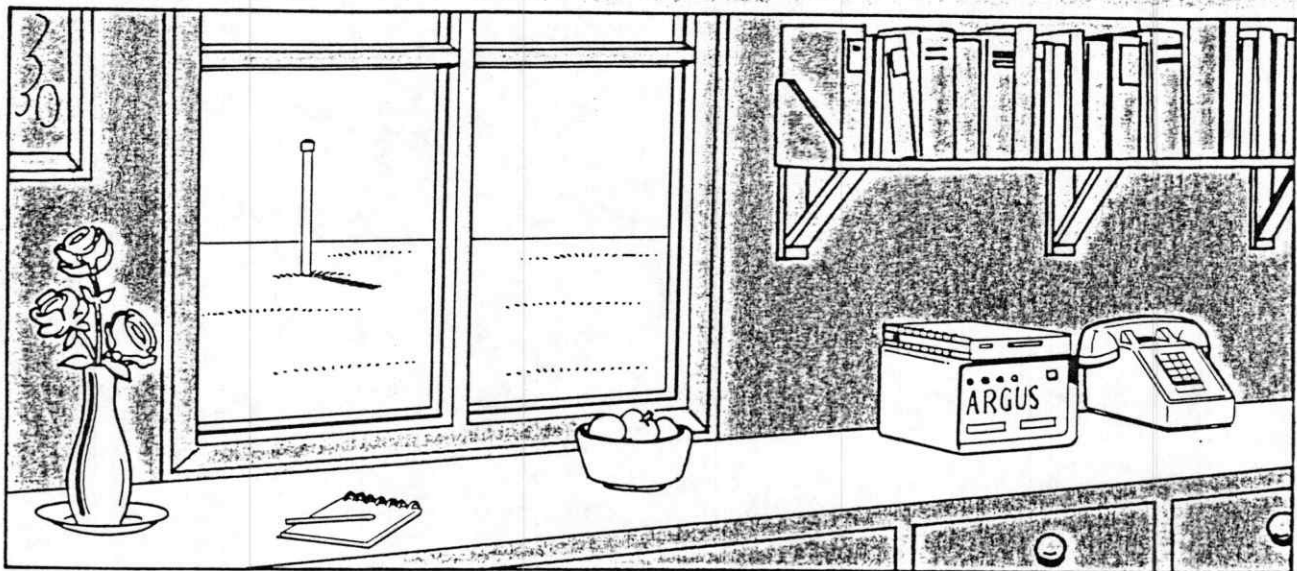
Yours.

Cowal Monitoring Group.

THE ARGUS PROJECT

GAMMA RADIATION MONITOR SYSTEM

PARTICIPATION IN THE ARGUS PROJECT

The Argus project is a system for nationwide measurement and collection of data on gamma radiation levels. Participation in the project provides you with automatic collection and storage of all the data from outstations operated within the project, and rapid access to this data.

Summaries of regional and national pattern changes will be accessible, along with analyses, explanations and extrapolations from the data.

Participation in the project will normally be based on buying an outstation and providing a suitable site for it. Other ways of gaining access to the raw data may be negotiated.

The Argus Project is designed to operate as a wholly independent service.

THE GRM1220/01 OUTSTATION

This is a complete gamma monitoring installation. It is designed to monitor constantly a geiger-counter head, storing counts for every 10 minute period. These are kept in memory along with the date and time each are recorded. Every night, at a pre-determined time, the unit rings up a host computer and, after exchanging passwords, sends the data it has collected. On completion of this transfer the outstation marks the data as being sent, so that in due course that section of memory may be overwritten with new data. At any time, if a printer is connected, a printout of all the data held may be obtained from the outstation. It is designed to a brief which requires all the equipment to operate reliably for ten years.

DATA TRANSMISSION

The unique feature of the Argus system is that the outstations initiate the data communications. This is unlike normal telephone linked data-logging networks, where the host polls passive stations. Our approach distributes the running costs and thus permits growth of the project. At one call charge-unit per night it is exceptionally cheap to contibute data to the project's independent network.

As well as manufacturing and installing GRM1220/01 outstations the Argus project runs a network host computer as a secure data collection service. It also provides immediate on-line computer access to this data. Analyses of data from each station and also an overview of all data will be available. Summaries of the data held by the project will be available to other interested parties.

The project uses a secure, error-checking communication protocol for the data transmission between outstations and the host computer(s). Mutual identification is ensured before any data pass.

If for any reason data are not correctly received by the host computer an outstation will try again later that night. To avoid loss of data the unit will protect stored data, continue operating as normal over the following day, and send two days' data the next night. The outstation can hold several days' data. Any unit not reporting or signalling a fault condition will be identified within 24hrs.

TECHNICAL SPECIFICATIONS

As standard, and in common with manufacturers of other background gamma monitoring equipment, each Argus outstation is fitted with a Mullard ZP1220/01 Geiger-Müller tube and provided with a stabilised 450 volt EHT power supply (The tube runs at the centre of the Gieger-Müller plateau). This tube has been preferred for its low intrinsic background count. It is energy compensated by Mini-Instruments Ltd, being normallised for Caesium 137. Overall system resolution time is accurately set to 210 microseconds (the maximum dead time specified for this tube). The geiger tube is supported in its environmental housing at 1 metre above ground level, ensuring that high energy beta particles are not counted. It is vertically aligned within its support to minimise counts produced by cosmic rays. A heavy concrete base, which is buried, provides stability for the complete monitor head post. There are two PVC outer casings (manufactured to BS3505) with a total thickness of 8mm.

Argus installation engineers will survey the gamma levels of the proposed site where outstations are to be linked into the network. A profile of each network outstation is held by the Argus project which includes the survey, geographical location and other relevant site details.

The monitor heads are designed with three concentric casings, ensuring long term resistance to damage by weather and wildlife. The monitor head post must be sited on well-drained grass-covered ground, ideally 30 metres away from buildings. The site should, if possible, be free from walls, paths, and roads, avoiding power lines.

If vandalism is likely to be a problem then additional protection can be provided by the project.

The maximum cable length between a standard monitor head and its data-logging control unit is 300 metres. An additional cable driver board is available where exceptional cable lengths are required.

The data-logging control unit is mains-powered and based on the well proven Motorola 6809 microprocessor. This controls the monitoring, timekeeping, network communications, data storage and printing. A maintenance-free internal battery supports the timekeeping and data storage functions in the event of mains failure, even over prolonged periods (a minumum of 4 weeks, typically 4 months).

The data-logging control unit has a Centronics printer port, a modem serial port, and is attached by cable to a dedicated modem.

External Printer

The Centronics socket enables connection of a parallel printer. As supplied the unit will drive any standard dot matrix printer. If required, other printers can be supported. Printed form layout of the data may also be changed to suit customer requirements.

Modem

This is a BT approved modem (V21/23 - Hayes compatible) which must be connected to your existing telephone line using a standard socket that takes a modern miniature plug (type 431A). To ensure a high level of communications efficiency a baud rate of 300 has been chosen as the modem speed for data transmission.

A telephone can be connected through the modem to the telephone line. This is usable except for one short period (normally less than a minute) when the outstation calls the host during the night.

An outstation may be fitted with a modem capable of running at higher speeds to suit user requirements.

PRICING POLICY FOR ARGUS GRM 1220/01 OUTSTATION

There are two options when installing Argus monitors:

1) A significant discount and long term support will be given to customers who agree to participate in the Argus Project with their outstations contributing to the database.

2) Where monitor stations are purchased to run as stand-alone units, or to operate within private networks not linked to the Argus Project, the full purchase price applies. Stations will have a one year guarantee.

WHAT YOU NEED TO INSTALL AN ARGUS OUTSTATION

1) An open, well-drained area of grass-covered ground.

2) A building nearby with a mains electricity supply and an existing telephone line *fitted with a modern socket.*

RECOMMENDED FURTHER READING

A guide to the measurement of environmental gamma-ray dose rate. By F.W. Spiers, J.A.B. Gibson & I.M.G. Thompson. Published on behalf of the British Committee on Radiation Units and Measurements by the National Physical Laboratory 1981.

Interim Report of the Radiation Monitoring Working Party - Institute of Environmental Health Officers. Revised April 1987.

Mullard Technical publication: Geiger Müller tubes. Publication No: 126328. June 1986.

Mullard technical handbook. Book 2 part 2b Geiger-Müller tubes, June 1986.

The total Argus system is not confined to operate solely for the measurement of background gamma radiation. Numerous alternative uses are possible e.g. remote constant monitoring of water and air pollution or noise levels etc. If you wish to apply the principles of the system described here to other applications, please consult us.

THE ARGUS PROJECT,

19 ST MARY TERRACE
RYTON
TYNE AND WEAR — NE40 3AL

Voice telephone : 091-413 6858

Data line : 091-413 6859

The Argus Project computer data line is on (091) ... 0327.
This operates 24 hours a day at all baud rates up to 2400.
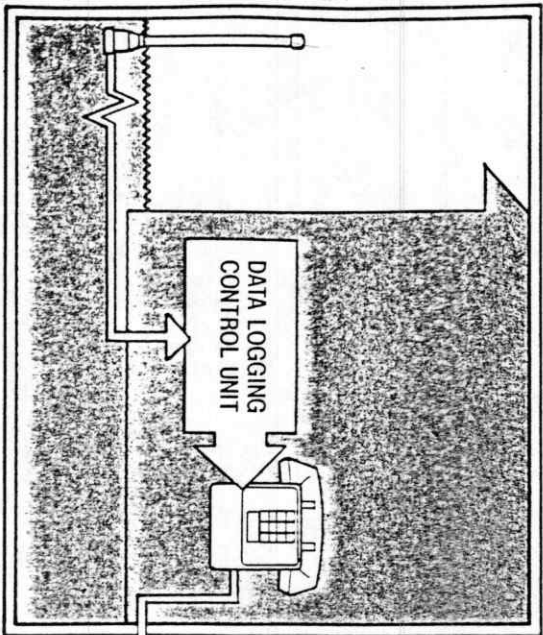
The monitor end is a Geiger-Müller tube encapsulated in a resilient weatherproof enclosure designed to be sited outdoors. The Geiger-Müller tube measures gamma radiation and is calibrated. It is connected by cable (which may be buried in the ground) to a sealed box inside a nearby building.

The box contains the monitor control unit, a purpose-built microcomputer which constantly records the radiation counts from the monitor head. When a button on the box is pushed, the records of the most recent counts are sent to a printer, if one is fitted.

The computer is connected to a modem, which is connected to the nearest telephone line. Most of the time this link is inactive and the phone is available for use in the normal way; but once every twenty-four hours, in the small hours of the morning, the monitor station rings up a host computer and sends the records of the radiation counts - a call of less than one minute.

DATA LOGGING CONTROL UNIT

DATA-CAPTURE HOST COMPUTER

The job of this computer is to accept the phone calls from all the outstations and receive the data sent. Abnormalities in the data can be identified and reported. A picture of the levels of background radiation can then be assembled in much the same way as a weather map is produced.

HOST COMPUTER

DATA ACCESS COMPUTER

INFORMATION SERVICE

As an authorised user - operating an Argus outstation, or subscribing to the service - you can use your own computing equipment to connect to the Data-Access computer and view or collect the network's radiation readings you are interested in. Abstracts and assessments of the readings will also be available, as will sets of data arranged to enable you to produce maps and graphs.

If you are operating an outstation, you can use the modem provided for connecting to the host, except for the short time that the outstation is sending its data to the host.
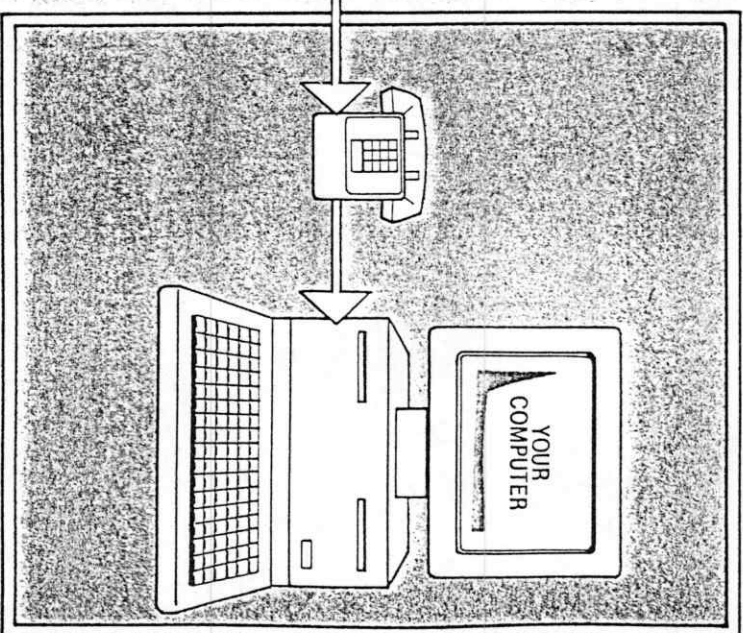
DATA-ACCESS COMPUTER

Both the original 'raw' readings for each station, and the analyses and extrapolations made from it, are stored in such a way as to be available to callers. Database techniques are used to allow required data to be extracted according to criteria of time and geographical area.

YOUR COMPUTER

NOTE: The modem supplied with the Argus outstation can be used to communicate with other computer-based services, such as Prestel and Telecom Gold.

A standard outstation comprises:

1) A ground standing monitor post containing a compensated, Mullard ZP1220/01, Geiger-Müller tube.

2) A cable (usually buried) between the monitor head and the Argus data logging unit.

3) An Argus data-logging unit complete with modem and telephone plug.

Installation is normally carried out by Argus engineers.

INSTALLATION REQUIREMENTS

What you have to provide:

1) A new style standard British Telecom extension socket on your phone system.

2) A mains electricity supply.

3) An open, grass covered, site within reasonable distance of the Argus data-logging unit.

OPTIONAL EXTRAS

1) A printer to provide a paper record of date and time stamped counts from your outstation.

2) An armoured cable sheath for vulnerable cable runs.

3) A cage to protect the monitor head in particularly exposed sites.

4) A computer system to call the host database and information service via the outstation.

INSTITUTIONS & ORGANISATIONS may be interested in a self-contained host computer system to set up and access an independent network of stations.

GLOSSARY

OUTSTATION
This consists of a Geiger-Müller detector head, a data gathering and storage computer, and a modem connected to a phone line.

MODEM
A means for passing computer signals, via a telephone line.

HOST COMPUTER
A data-collecting computer at the hub of a network of outstations.

DATA ACCESS COMPUTER
A dial-up information service, similar to Telecom Gold.

The Argus network system can also be used for other environmental data gathering.

For further information and Technical Specifications please contact:

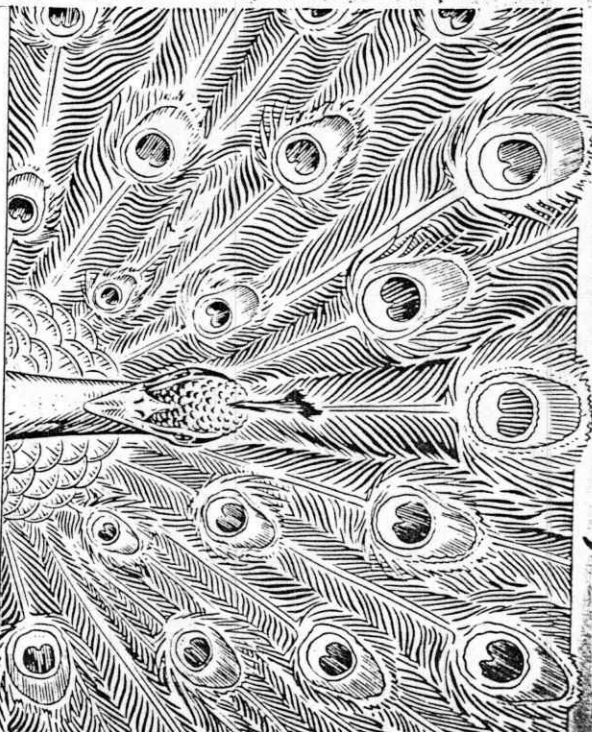**The Argus Project,**

19 St Mary's Terrace
Ryton
Tyne and Wear - NE40 3AL

Voice telephone: 091-413 6858
Data line: 091-413 6857

THE ARGUS PROJECT

GAMMA RADIATION MONITOR SYSTEM

The level of background radiation has increased irreversibly in recent decades. Events have highlighted our need to monitor these changes, and reliable information about this should be made widely available.

The Argus Project is designed to do this with a network of unattended gamma radiation monitoring stations.

Monitors linked automatically by telephone line to a central computer will provide regular updated information reliably and at low cost.

The Argus Project

T H E A R G U S P R O J E C T

Telephone Lines

Location :
95 Bewick Road
GATESHEAD
Tyne & Wear
NE8 1RS

Voice   : (091) 479 6272
Computer : (091) 498 0327

OS map ref. : NS 793420E 934075N

Outstation ref. :   ALBERT HALLS
Monitor type :   STIRLING
                    SCOTLAND

Demonstration
GRM1220/01 - background gamma

LOG OF GAMMA COUNTS (15 minute periods)

Printed out on: June 19, 1988 at 19:28

RAW DATA
OUTSTATION
PRINTOUT

Monthly Overview — Counts for 12 hours 1 Oct to 1 Nov

Gamma counts (Thousands)

12 hours per division

10 min. counts (low Fell) Oct 19

Gamma counts

10 minutes per division

<< HIGH RESOLUTION
<< DATA EVERY DAY

12 hr counts for Sep22–Oct6 Gateshead

Gamma counts (Thousands)

Cowlswcrth

Low Fell

12 hour time intevls

STATION COMPARISONS

12 hr counts for Nov 1988 Low Fell

Gamma counts (Thousands)

12 hour time intervals

MONTHLY OVERVIEW

National Radiological Protection Board

Radiation Metrology: Chilton, Didcot, Oxon OX11 0RQ   Telephone: 0235 831600

Calibration Report

The Argus Project
95 Bewick Road
Gateshead
Tyne & Wear   NE8 1RS
FAO   Graham Dennan

RH 6061

28th July 1988

Test of Argus Project monitor

The detector was mounted horizontally with the radiation beam incident normal to the detector axis. The complete unit was irradiated, ie, inside its final large counting tube. The results are given below.

Source	Dose rate (μGy h^{-1} to air above background)	Count rate (above background)	Response ($counts^{-1}$ dose rate)
^{137}Cs	0.4705	7.20	15.3
	2.514	39.5	15.7
	5.291	82.5	15.6
	15.11	230.5	15.3
	64.41	831.1	12.9
	187.52	1772	9.5
	488.7	2370	4.8
	1164	5	
^{60}Co	5.050	98.4	19.5
^{226}Ra	5.773	105.6	18.3
^{241}Am	1.660	23.6	14.3

The background count rate was 1.53 s^{-1}. This is a mixture of inherent, cosmic and environmental gamma radiation signal. The integration time at each dose rate was chosen to give at least 8000 counts. The background signal was integrated for 1000 seconds.

Dead time

Dead time was calculated on the basis that the sensitivity that the counter sensitivity was 15.7 s^{-1} μGy h^{-1} at low count rates and using the standard equation.

$$n = \frac{n_o}{1 - n_o \, t}$$

n = correct rate
n$_o$ = observed rate
t = dead time

The results are given below.

Doserate (μGy h^{-1})	Count rate Observed	Count rate Corrected	Dead time (μS)
64.41	831	1011	214
187.52	1772	2964	225
488.7	2370	7673	299

Energy response

The ratio of the response to ^{241}Am γ radiation (60 keV) and ^{137}Cs γ radiation (662 keV) is 0.92. This agrees with the standard value for modern NCRl detectors.

Wall transmission

The observed sensitivity of the detector is identical to the nominal sensitivity of the RIRNEl monitor and is 3X less than the standard value of the NCRl.

Background

The observed background count rate is typical of the type in the horizontal orientation. It will be less when held vertical.

Comments

The instrument seems satisfactory for its intended use.

P H Burgess

ARGUS GAMMA STATIONS

November 1991

1 Dunoon
2 Ayr
3 Low Fell Tyne & Wear
4
5 Ryton Tyne & Wear
6 North Yorkshire
7 North Wales
8 Oxford
9 Hillingdon
10 London
11 Reading
12 Fleet
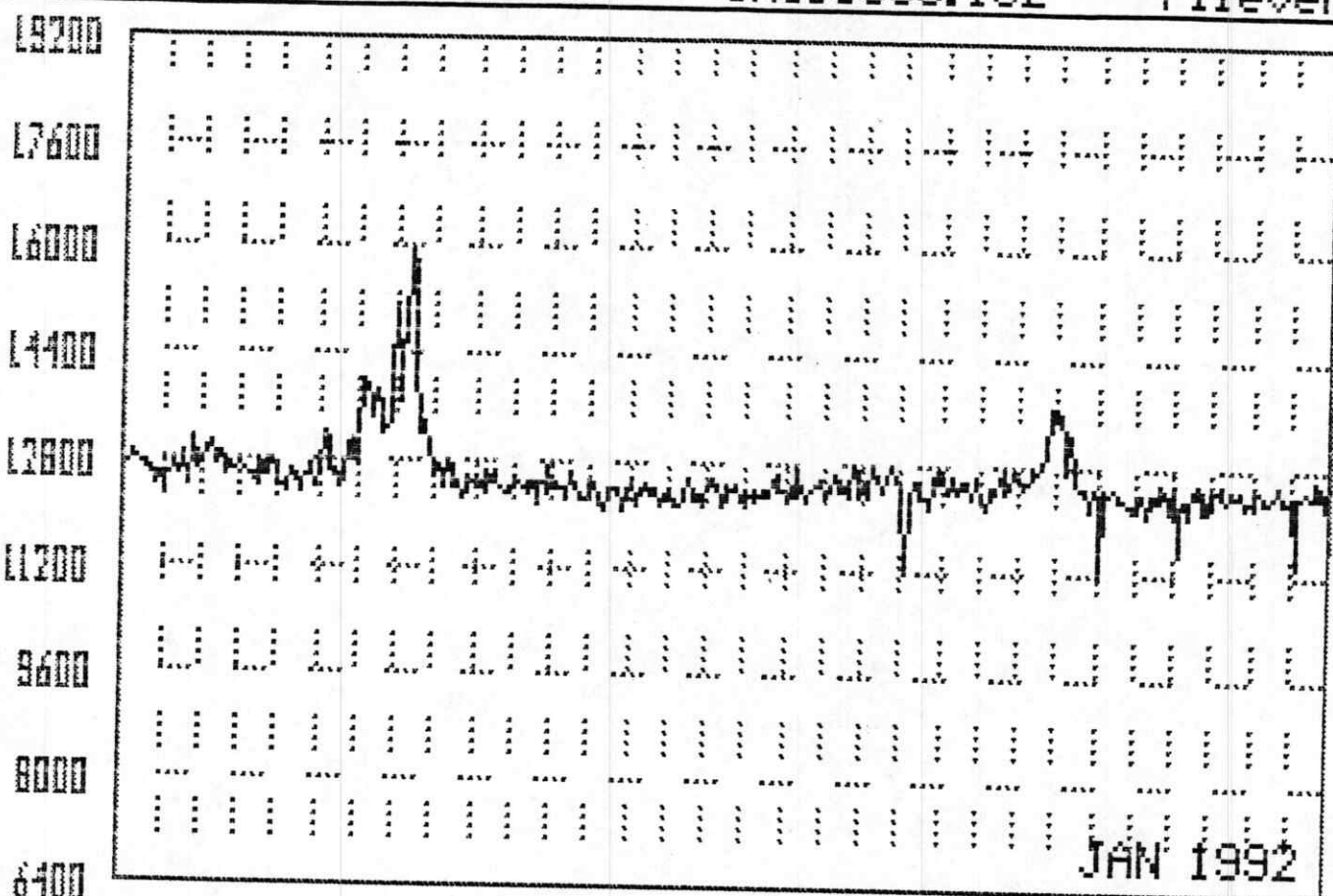13 Southampton
14 Southampton University
15 Portsmouth
16 Bournemouth
17 Wareham

Figure 1

The location of Argus
project outstations

THE TWO DOTS MARKED IN BY PEN
ARE THE LATEST ~~TEST~~ STATIONS TO
COME ON STREAM
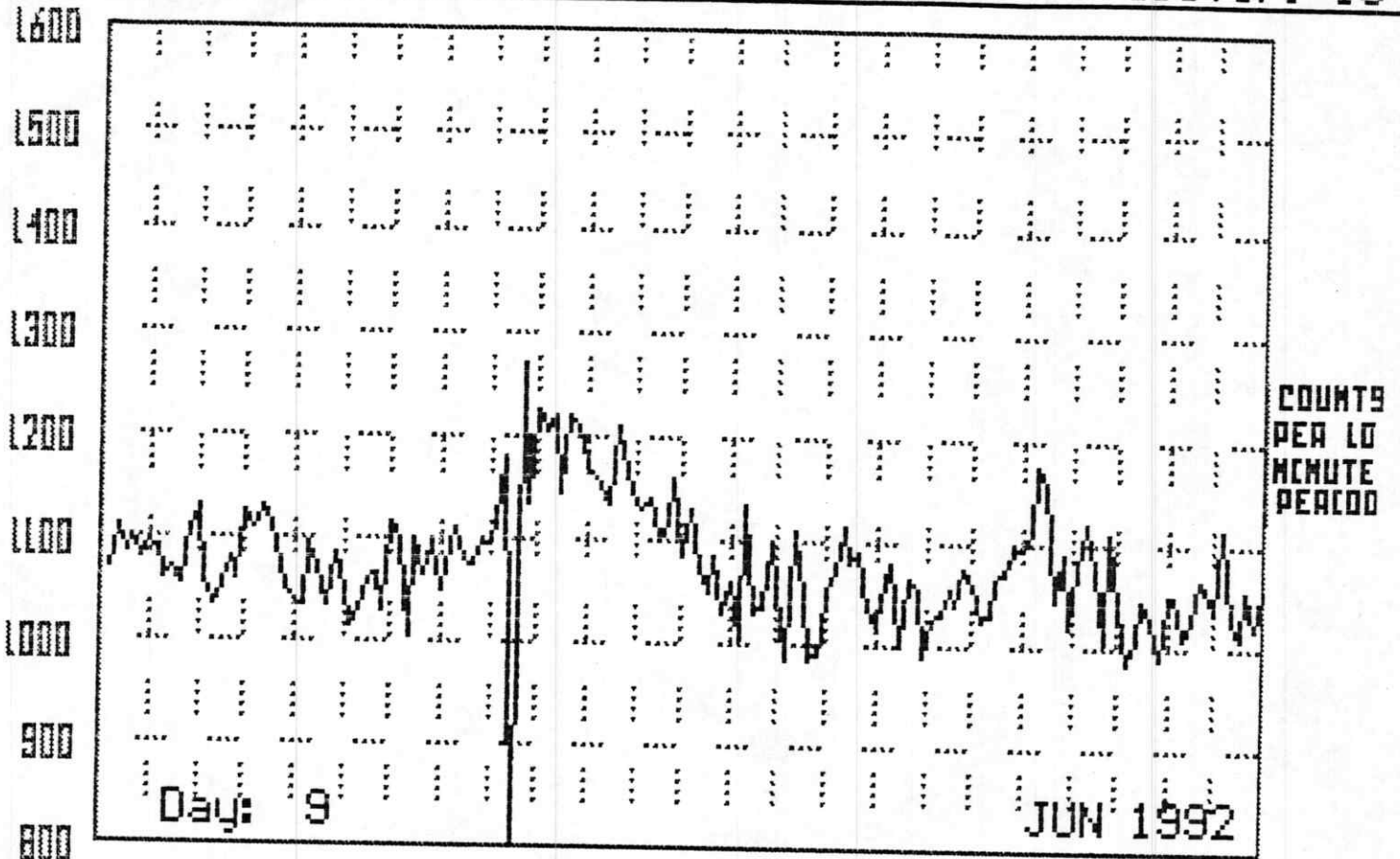
COUNTS
PER ½
HOUR
PERIOD

L9200
L7600
L6000
L4400
L2800
L1200
9600
8000
6400

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

JAN 1992

MONTH-MODE   DOWN ARROW-RAW, F1-HLP F2-SCALE, F10-EXIT

1600
1500
1400
1300
1200   COUNTS
1100   PER 10
1000   MINUTE
 900   PERIOD
 800

Day: 9   JUN 1992

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

F1-HLP, F2-SCALE, F10-EXIT, INS-MNTH, DOWN ARR-RAW

ARGUS Data View v2.06   File: GNS15800.692   File Version: 15

Time												
0:00	1071	1108	1087	1099	1081	1097	1089	1062	1071	1057	1108	1133
2:00	1056	1037	1057	1081	1059	1128	1112	1129	1117	1089	1048	1042
4:00	1038	1096	1068	1034	1085	1043	1016	1032	1060	1067	1028	1115
6:00	1096	1005	1100	1067	1096	1048	1095	1108	1081	1076	1102	1094
8:00	1117	1183	0	1272	1136	1225	1205	1220	1145	1222	1212	1170
10:00	1159	1149	1137	1213	1165	1146	1132	1140	1101	1123	1160	1088
12:00	1131	1069	1052	1087	1028	1060	1006	1134	1029	1034	1098	1054
14:00	985	1108	1046	985	987	1048	1074	1114	1083	1090	1036	1019
16:00	1043	1080	1001	1064	1056	992	1023	1031	1053	1040	1074	1019
18:00	1026	1032	1066	1069	1095	1095	1111	1178	1163	1047	1089	1058
20:00	1079	1119	1078	1003	1108	1040	986	1011	1046	1026	991	1020
22:00	1051	1012	1029	1065	1059	1038	1114	1025	1011	1056	1018	1054