

S.S. KOZLOV, PhD student, senior lecturer, NTU “KhPI”

AUTOMATIC DATA COLLECTION FOR INCOHERENT SCATTER COMPLEX

The creation of the automated data collection system for incoherent scatter complex is justified. The main part of the parameters influencing the control action was considered. The simplified implementation of automated data collection system is presented.

Keywords: automated data acquisition system, the control action, incoherent scatter radar, the program product.

Introduction. Changing settings on the radar systems of the Institute of the ionosphere will improve the information content of the data. Manage settings apparatus research observatory Institute ionosphere that affect the emission and reception mode, it is advisable to carry out, with the help of the control action. The control action is a requirement, which contains information about the required parameters of receiving and transmitting equipment and instruments, performing primary data processing.

Purpose of forming automation control action – more efficient use of the potential of the complex IS:

1. Providing operator relevant data for decision making.
2. Acceleration of certain operations to collect and process data.
3. Reducing the number of decisions on the measurement mode and the increased scrutiny.
4. Improving management efficiency.
5. Increasing the validity of decisions

On the formation of the content control action affects a large number of elements, differing in composition, characteristics, number of states, properties, significance, etc. In the process of analyzing the composition of the system, defining the control action, it was decided to divide the members into groups:

- Geophysical (current state of the ionosphere, the processes in the Sun);
- Technical (the technical condition of the complex Ionosonde);
- Geographic (geographical location of the radar);
- Information (set value and the study parameters, altitude range, temporal resolution);
- External (measured as part of an international network of radars HP);
- Energy (energy availability).

Automating the process of formation of the control action involves the need to describe the system model. A simplified model of the system is presented below (Fig. 1).

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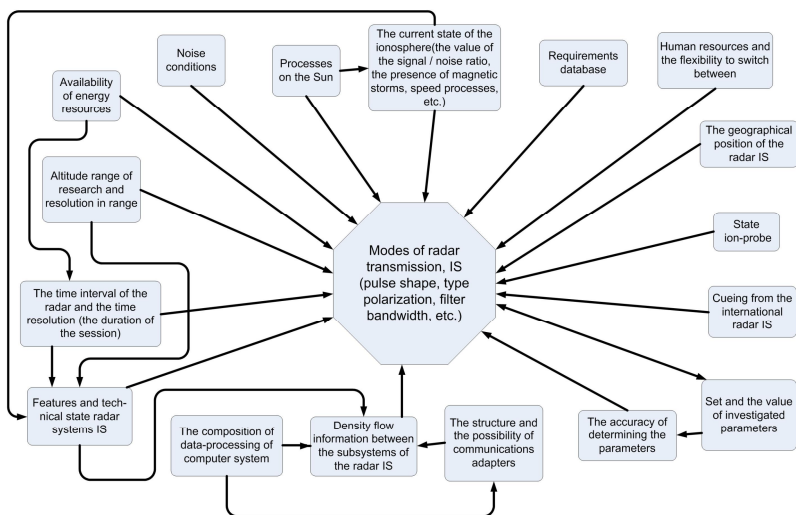


Fig. 1 – Simplified model of the automation system control action.

To resolve discrepancies between the degree of automation of complex IS to manage its energy resources, control and operation of the technical condition and degree of automation of process control information, a special operations support software of the automated data collection system.

Developed software written in HTML with the exception of under- and JavaScript library jQuery script itself. The client program is able to provide real-time information obtained from various sources, connect to the database of the Institute of Ionosphere and other research agencies. This software system is automatically gathering information. The software provides the operator with easy access to information, allows you to search values on the specified criteria, warns of excessive parameters thresholds, etc. Managing the measurements can be carried out at the request of the operator or to be automated in accordance with the output generated.

When designing a system was chosen programming language HTML, the body of which is connected script, which in turn is required for the program as script performs the basic function graph display an HTML page, the data output from the array with the definition of the maximum and minimum values of the subsequent construction schedules. Java script loosely connected to the body and the program runs without errors. Errors should be avoided, because this can cause erroneous results and conclusions of the program. When reading a web browser

page, the browser first tag finds `<script>`, executes its contents, and then continues reading the program code.

Data output from the array in graphical form is carried out through information from different websites and web-services.

To convert a given array and display it on a Web page, a table was used connect the special function: *function array2table (\$ array, \$ recursive = false, \$ return = false, \$ null = '')*, this function works with amounts of data, and outputs the result as a table on the html page. After the conclusion of the data is the possibility of their graphical representation of how the value of time.

Input parameters:

array \$ array - array output

bool \$ recursive - recursively nested arrays

bool \$ return - displays the result on the screen (echo) or returns a string

string \$ null - a string that is substituted for the empty cells.

Body of the function:

`<?`

```
function array2table ($ array, $ recursive = false, $ return = false, $ null = "")
{
// Check the input data
if (empty ($ array) || ! is_array ($ array)) {
return false;
}
if (! isset ($ array [0]) || ! is_array ($ array [0])) {
$ array = array ($ array);
}
// Start the table
$ table = "<table> \n";
// The table headings
$ table. = "\t <tr>";
foreach (array_keys ($ array [0]) as $ heading) {
$ table. = '<th>'. $ heading. '</th>';
} $ table. = "</tr> \n";
foreach ($ array as $ row) {
$ table. = "\t <tr>"; foreach ($ row as $ cell)
{
$ table. = '<td>';
if (is_object ($ cell)) { $ cell = (array) $ cell; }
if ($ recursive === true && is_array ($ cell) && ! empty ($ cell)) {
// Recursion
$ table. = "\n". array2table ($ cell, true, true). "\n";
} Else {
$ table. = (strlen ($ cell) > 0)?
htmlspecialchars ((string) $ cell): $ null;
}
$ table. = '</td>';
```

```

}
$ table. = "</tr> \ n";
}
// End
$ table. = '</ table>';
// Output
if ($ return === false) {
echo $ table;
}
Else {
return $ table;
}
?>

```

The function is written in php, which in turn can be connected to the html code using javascript. Javascript to connect php function is basically the program code.

Conclusions. The automation of the control action will facilitate the collection of information necessary to select the operating mode of the complex, more economical use of energy, improve information content of the data.

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Обосновано создание автоматизированной системы сбора информации для комплекса некогерентного рассеяния. Рассмотрен основной состав параметров, влияющий на управляющее воздействие. Представлена упрощённая реализация автоматизированной системы сбора информации.

Ключевые слова: автоматизированная система сбора информации, управляющее воздействие, радар некогерентного рассеяния, программный продукт.

Обґрунтовано створення автоматизованої системи збору інформації для комплексу некогерентного розсіювання. Розглянуто основний склад параметрів, що впливає на керуючий вплив. Представлена спрощена реалізація автоматизованої системи збору інформації.

Ключові слова: автоматизована система збору інформації, керуючий вплив, радар некогерентного розсіювання, програмний продукт.