

**Applying working knowledge for well managing the Upper Air Stations Network
in order to preserve its historical achievements and work
on continuing its development and prosperity**

By

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ABSTRACT

The main Egyptian upper air stations network had been constructed since fifty years ago by first constructing the three upper air stations in Helwan, Aswan and Matruh. At that time the upper air observations were done by the aid of using manual radars, radiotheodolites, radiosonde receivers, sliding rules and wind plotting boards. In 1995 another upper air station was constructed in Arish, and in 2002 both Farafra and Qena upper Air stations were constructed. The six upper air stations are currently equipped with modern automatic radiotheodolites and the upper air weather reports are generated by accompanied computers.

The author explains how to prepare the Electronic Technicians in the field of modern electronics, communications system and accompanied computers software and hardware to help the technicians well digest the whole upper air observing process and consequently be able to diagnose and solve various technical problems. The author also points out the difficulties faced in providing the required radiosonde and balloons in order to keep the six stations in regular continuous operation.

1- Introduction:

The upper air information and reports are considered the backbone of the weather analysis, forecasting and aeronautical meteorology. The costs for building a new upper air station and equipping it are very high. The daily costs for operating such station and providing it with radiosondes and balloons are also very high. The capacity building of high standard upper air technicians and observers to keep the upper air stations in regular and continuous operation for long times and to have accurate radiosonde information and reports is not an easy task. For all those reasons it is very important to well manage the upper air stations network and preserve its historical achievements and continuing its development and prosperity.

2- Historical survey of the upper air stations network in Egypt:

There are six upper air stations now in Egypt located in Cairo, Aswan, Matruh, Arish, Qena and Farafra. They started work in 1959, 1962, 1965, 1995, 2003 and 2003 respectively. They all were equipped with manual radars, radiosonde receivers and manual radiotheodolites. Now all these stations are equipped with automatic radiotheodolites. The future plan aims at including another three upper air stations to be located in Siwa oasis, Oweinat and Halaib. Find in the attached map the currently implemented upper air stations as well as the stations that will be implemented in the future.

3- Capacity building of high standard upper air Observers and Technicians:

Upper air Observers and Technicians should have a Diploma in electronics from a specialized technical institute after obtaining their high school general certificate, science branch. As soon as they join EMA a special training course in upper air observations for six months must be taken, that course include:

- a) Introduction to general meteorology and its branches; Physical Met., Dynamical Met, Synoptic Met. and Climatology.
- b) Manual radiosonde calculation and plotting Adiabatic and wind charts and extracting codes.
- c) Training on operating automated upper air systems equipped with personal computers including solving software problems.
- d) Field training for additional two months in one of the automated upper air stations.

After completing this training, the upper air Observers should become ready to carry out the regular work of upper air stations equipped with high technological equipment and sophisticated software programs as well as distinguishing between correct and non-correct data indicated on the PC's screen, in addition to intervening to eliminate errors. Also they should be carrying out the essential tests and adjustments for radiosondes before launching in order to isolate the faulty sondes for either repair or replacement by the manufacturers free of charge according to the contract between them and us.

4- Preparing the high standard Technicians:

It is very important to have high standard electronic Technicians to perform the frequently maintenance and necessary repair of the automated upper air systems as well as having a complete set of spare parts precisely chosen by technicians themselves to preserve their regularity and continuity of operation. In this aspects those technicians should have regular specialized and advanced courses in:

- English language
- Modern electronics
- Communication systems
- Computer Engineering (Hardware)
- Advanced Software programs

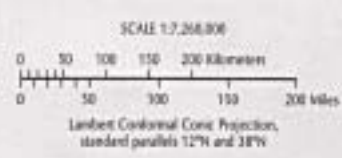
to help technicians well digest the whole upper air observing process and consequently be able to diagnose and solve various technical problems.

5- Difficulties faced in providing the required radiosondes and balloons:

The fact that the radiosondes and balloons are very costly, specially radiosondes that are working with GPS, which are used to avoid the problems of calculating the wind in case of low elevation angles of radiotheodolite. Consequently it is required exerting major effort to convince the authorized (non-specialized) people to dedicate the required budget for buying radiosondes and balloons. In order to reduce the cost, we sometimes have to minimize the operation program of upper air stations during summer (from first of May till end of September) which happens to be a period of weather stability. Usually Helwan, Aswan and Matruh make one observation at 11:30 GMT, whereas Arish, Farafra and Qena make one observation at 23:30 GMT. Occasionally, at first of September we have to make two observations in Helwan for environmental proposes.

6- Conclusion:

In conclusion, to preserve the historical achievement of those upper air stations and maintaining their regular operation plus their development and prosperity, we have to well manage the network of those stations by well preparing the observers and technicians to help solve all technical problems, in addition to providing the required radiosondes and balloons for operation.



- International boundary
- ★ National capital
- Governorate capital
- Railroad
- Expressway
- Road
- - - Track