

National Bureau of Standards

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DISTURBANCE RATING ON VALUES OF IRPL QUALITY-FIGURE SCALEFROM A.T.& T. CO. TRANSMISSION DISTURBANCE REPORTSTO REPLACE T.D. FIGURES AS REPORTED.

The following method has been used to formulate a disturbance rating from the average daily field intensities used in the T.D. reports of the A.T.& T. Co. that agrees more closely with the IRPL type of disturbance rating than does the published "T.D. Figure".

Since 1 January 1943, on which date the method of obtaining the average daily field strengths was changed, the moving average, on which the daily deviations forming the T.D. Figures are based, has rarely changed. This means that for long periods no new days are considered sufficiently undisturbed to change the moving average. Thus current T.D. Figures tend to stay high in value, indicating more disturbance than they should.

To obtain a moving average that changes continuously, the IRPL computed a 31-day running median from the average daily field intensities, starting with the data for 1 January 1943, placing the value found on the sixteenth day of the cycle. A 31-day cycle was chosen since it gave a central day on which to place the median and was closest to the monthly basis on which T.D. Figures have been reported. Since radio propagation disturbance is associated with the solar rotation cycle, the use of a 27-day cycle might have been chosen, but the difference between the running medians in the two cases is not significant.

For each day the deviation of the actual average daily field intensity from the running median was computed. Using the data from 1 January 1943, through August 1945, frequency distribution and cumulative percentage curves were made, grouping the deviations to the nearest digit.

A master scale of the actual occurrence of the values of the IRPL quality figure scale was made for the North Atlantic path from the reports received at the IRPL, made on the quality-figure-scale values. By using a cumulative percentage curve derived from the master scale and one derived from the daily deviations of the average daily field intensities from the running median, a conversion scale was formed by equating equal percentages on the two curves. By this conversion scale, shown as Fig. 1, the daily deviation of the average daily field intensity from the 31-day running median is converted into a

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value on the IRPL 1-9 quality-figure scale, as follows:

1 - Useless	4 - Poor to fair	7 - Good
2 - Very poor	5 - Fair	8 - Very good
3 - Poor	6 - Fair to good	9 - Excellent

The values thus found are then used in conjunction with all the other reports received by the IRPL to produce a North Atlantic Radio Propagation Quality Figure for each Greenwich half-day.

It seems that by the method described above a better picture is given of disturbed or quiet radio propagation conditions on any one day, than by the T.D. Figures as reported at present.

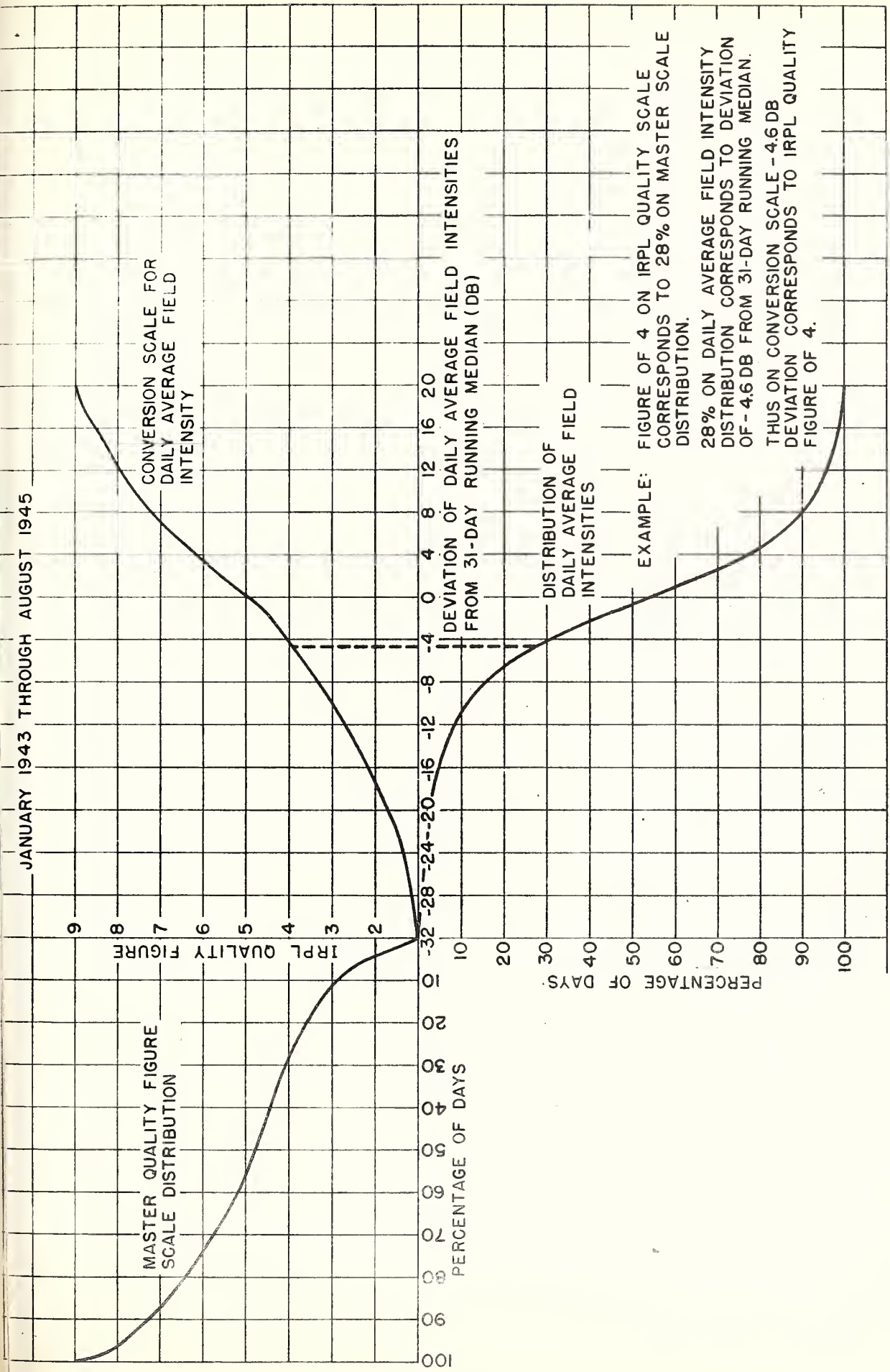


Fig. 1. CONVERSION SCALE FOR VALUES OF DAILY DEVIATIONS OF T.D. AVERAGE DAILY FIELDS FROM 31-DAY RUNNING MEDIAN OF THE AVERAGE DAILY FIELDS INTO VALUES OF IRPL QUALITY FIGURE SCALE.

