

432 MHz Dish Feed System

by K4QI

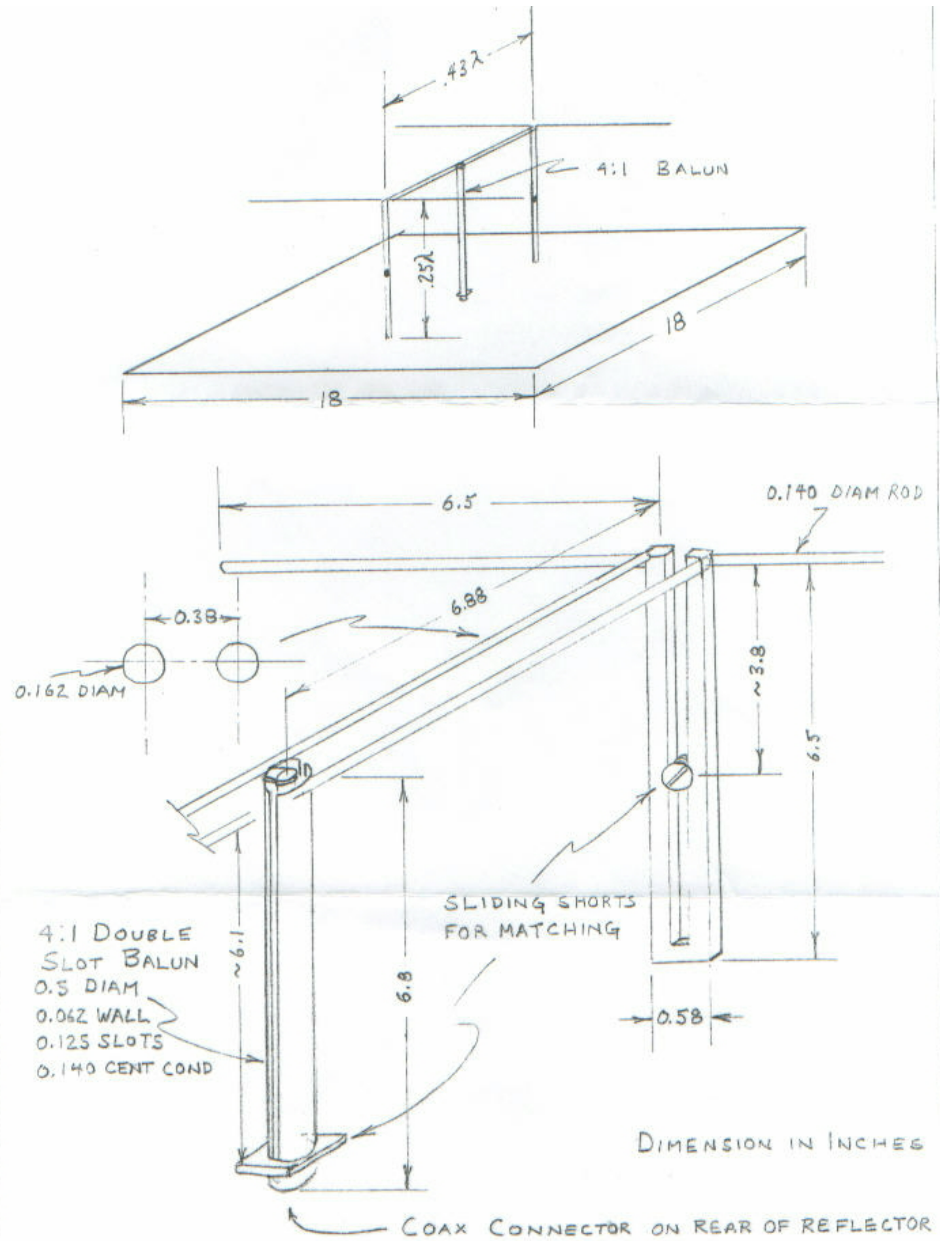
The feed system was derived from a NEC analysis attempting to design a dual feed with identical patterns in both E and H planes and a 10 dB illumination taper for a F/D of .45. NEC indicated that 2 dipoles spaced 0.43 wavelength at 0.25 wavelength above a square reflector 0.65 wavelength on a side would produce such a result. A prototype was built and measured and was found to produce results similar to the NEC prediction.

From the feed point of the antenna, the impedance is $50 + j0$ ohms. Going through the 1:4 balun, the impedance transforms to $200 + j0$ meaning that each phasing line must present $400 + j0$. As an approximation, the phasing lines were constructed for impedance of the geometric mean of 400 and 73 ohms or 173 ohms. Because the phasing lines are shorter than 0.25 wavelengths, the impedance presented to the dipole is approximately $78 - j35$ ohm. The real part is very close to the desired value but the reactive component must be tuned out. The susceptance equivalency of this impedance presents a parallel capacitance that can be tuned out by a parallel inductance. This inductance is formed by a "hair pin" built into the support for the dipoles.

Sliding shorts are provided in each dipole support and at the base of the 4:1 slot balun. By adjusting these shorts, the return loss can be trimmed to well below 30 dB but only over a relative over a narrow band. A good compromise is probably around 26 dB, which will give a couple MHz of bandwidth.

With the feed point on the rear of the reflector, a relay and preamp enclosure can be conveniently built in this location. Dimensions are given in inches. With the tuning flexibility of the sliding shorts, dimensions should not be particularly critical within reason. This is especially true of element diameters.

13.752
 13.753
 13.754
 13.755
 13.756
 13.757
 13.758
 13.759
 13.760
 13.761
 13.762
 13.763
 13.764
 13.765
 13.766
 13.767
 13.768
 13.769
 13.770
 13.771
 13.772
 13.773
 13.774
 13.775
 13.776
 13.777
 13.778
 13.779
 13.780
 13.781
 13.782
 13.783
 13.784
 13.785
 13.786
 13.787
 13.788
 13.789
 13.790
 13.791
 13.792
 13.793
 13.794
 13.795
 13.796
 13.797
 13.798
 13.799
 13.800
 13.801
 13.802
 13.803
 13.804
 13.805
 13.806
 13.807
 13.808
 13.809
 13.810
 13.811
 13.812
 13.813
 13.814
 13.815
 13.816
 13.817
 13.818
 13.819
 13.820
 13.821
 13.822
 13.823
 13.824
 13.825
 13.826
 13.827
 13.828
 13.829
 13.830
 13.831
 13.832
 13.833
 13.834
 13.835
 13.836
 13.837
 13.838
 13.839
 13.840
 13.841
 13.842
 13.843
 13.844
 13.845
 13.846
 13.847
 13.848
 13.849
 13.850
 13.851
 13.852
 13.853
 13.854
 13.855
 13.856
 13.857
 13.858
 13.859
 13.860
 13.861
 13.862
 13.863
 13.864
 13.865
 13.866
 13.867
 13.868
 13.869
 13.870
 13.871
 13.872
 13.873
 13.874
 13.875
 13.876
 13.877
 13.878
 13.879
 13.880
 13.881
 13.882
 13.883
 13.884
 13.885
 13.886
 13.887
 13.888
 13.889
 13.890
 13.891
 13.892
 13.893
 13.894
 13.895
 13.896
 13.897
 13.898
 13.899
 13.900
 13.901
 13.902
 13.903
 13.904
 13.905
 13.906
 13.907
 13.908
 13.909
 13.910
 13.911
 13.912
 13.913
 13.914
 13.915
 13.916
 13.917
 13.918
 13.919
 13.920
 13.921
 13.922
 13.923
 13.924
 13.925
 13.926
 13.927
 13.928
 13.929
 13.930
 13.931
 13.932
 13.933
 13.934
 13.935
 13.936
 13.937
 13.938
 13.939
 13.940
 13.941
 13.942
 13.943
 13.944
 13.945
 13.946
 13.947
 13.948
 13.949
 13.950
 13.951
 13.952
 13.953
 13.954
 13.955
 13.956
 13.957
 13.958
 13.959
 13.960
 13.961
 13.962
 13.963
 13.964
 13.965
 13.966
 13.967
 13.968
 13.969
 13.970
 13.971
 13.972
 13.973
 13.974
 13.975
 13.976
 13.977
 13.978
 13.979
 13.980
 13.981
 13.982
 13.983
 13.984
 13.985
 13.986
 13.987
 13.988
 13.989
 13.990
 13.991
 13.992
 13.993
 13.994
 13.995
 13.996
 13.997
 13.998
 13.999
 14.000



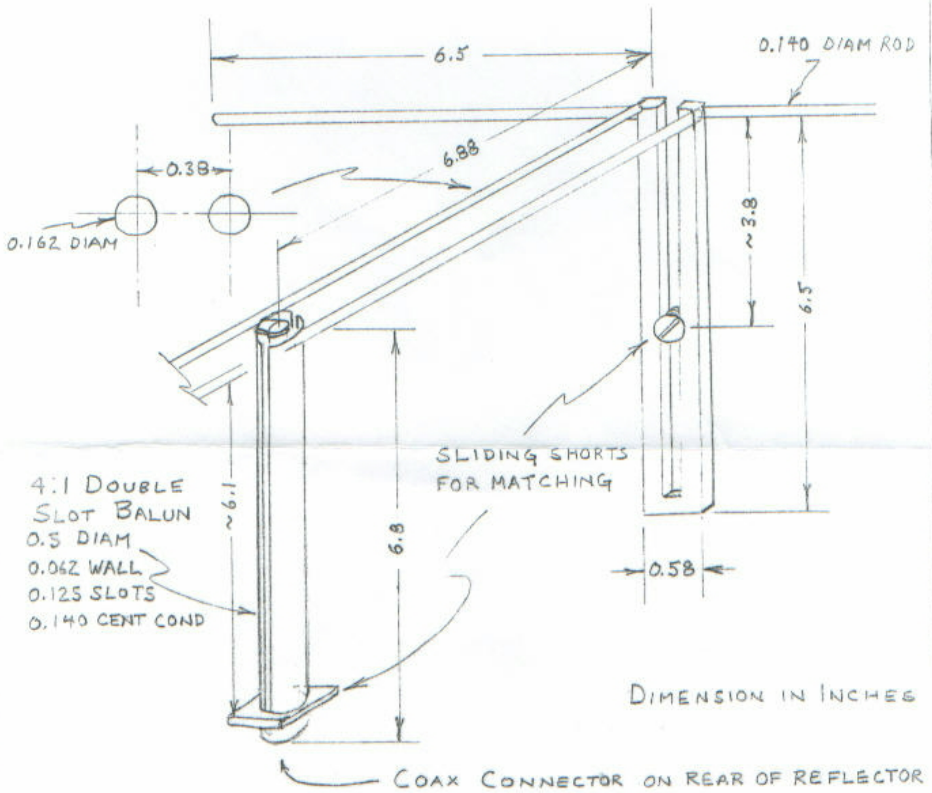
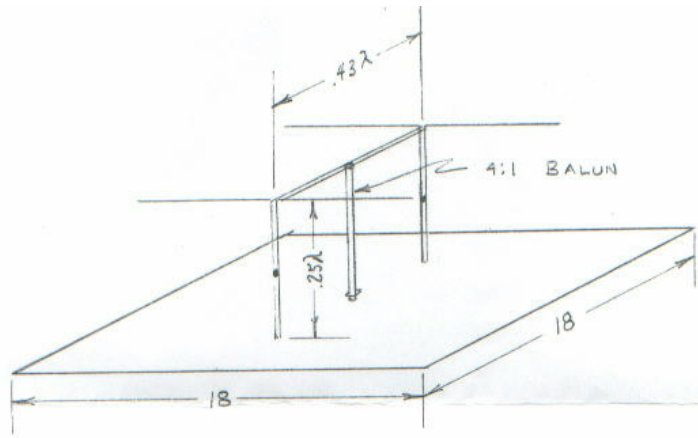
432 MHZ EQUAL E & H FIELD DISH FEED

K4QI
2/16/98

DIMENSION IN INCHES

COAX CONNECTOR ON REAR OF REFLECTOR

13.752
 13.753
 13.754
 13.755
 13.756
 13.757
 13.758
 13.759
 13.760
 13.761
 13.762
 13.763
 13.764
 13.765
 13.766
 13.767
 13.768
 13.769
 13.770
 13.771
 13.772
 13.773
 13.774
 13.775
 13.776
 13.777
 13.778
 13.779
 13.780
 13.781
 13.782
 13.783
 13.784
 13.785
 13.786
 13.787
 13.788
 13.789
 13.790
 13.791
 13.792
 13.793
 13.794
 13.795
 13.796
 13.797
 13.798
 13.799
 13.800
 13.801
 13.802
 13.803
 13.804
 13.805
 13.806
 13.807
 13.808
 13.809
 13.810
 13.811
 13.812
 13.813
 13.814
 13.815
 13.816
 13.817
 13.818
 13.819
 13.820
 13.821
 13.822
 13.823
 13.824
 13.825
 13.826
 13.827
 13.828
 13.829
 13.830
 13.831
 13.832
 13.833
 13.834
 13.835
 13.836
 13.837
 13.838
 13.839
 13.840
 13.841
 13.842
 13.843
 13.844
 13.845
 13.846
 13.847
 13.848
 13.849
 13.850
 13.851
 13.852
 13.853
 13.854
 13.855
 13.856
 13.857
 13.858
 13.859
 13.860
 13.861
 13.862
 13.863
 13.864
 13.865
 13.866
 13.867
 13.868
 13.869
 13.870
 13.871
 13.872
 13.873
 13.874
 13.875
 13.876
 13.877
 13.878
 13.879
 13.880
 13.881
 13.882
 13.883
 13.884
 13.885
 13.886
 13.887
 13.888
 13.889
 13.890
 13.891
 13.892
 13.893
 13.894
 13.895
 13.896
 13.897
 13.898
 13.899
 13.900
 13.901
 13.902
 13.903
 13.904
 13.905
 13.906
 13.907
 13.908
 13.909
 13.910
 13.911
 13.912
 13.913
 13.914
 13.915
 13.916
 13.917
 13.918
 13.919
 13.920
 13.921
 13.922
 13.923
 13.924
 13.925
 13.926
 13.927
 13.928
 13.929
 13.930
 13.931
 13.932
 13.933
 13.934
 13.935
 13.936
 13.937
 13.938
 13.939
 13.940
 13.941
 13.942
 13.943
 13.944
 13.945
 13.946
 13.947
 13.948
 13.949
 13.950
 13.951
 13.952
 13.953
 13.954
 13.955
 13.956
 13.957
 13.958
 13.959
 13.960
 13.961
 13.962
 13.963
 13.964
 13.965
 13.966
 13.967
 13.968
 13.969
 13.970
 13.971
 13.972
 13.973
 13.974
 13.975
 13.976
 13.977
 13.978
 13.979
 13.980
 13.981
 13.982
 13.983
 13.984
 13.985
 13.986
 13.987
 13.988
 13.989
 13.990
 13.991
 13.992
 13.993
 13.994
 13.995
 13.996
 13.997
 13.998
 13.999
 14.000



432 MHZ EQUAL E & H FIELD DISH FEED

K4QI
2/16/98