

VLBA ACQUISITION MEMO #183

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Area Code 508

692-4764

To: VLBA Acquisition Group
From: Alan E.E. Rogers
Subject: Test fixture for matching mixers in the SSB submodule of the BBC

Introduction

The SSB mixer image rejection in the BBC is largely limited by the degree to which the mixers can be matched. This is a difficult task as the matching has to be good over the entire IF range from 500 MHz to 1000 MHz. At present, mixers have been soldered into the SSB mixer submodule without any prior tests. Better performance (needed to meet the 26 dB image rejection specification) should be achieved by first selecting pairs of mixers whose match has been checked in a test fixture.

Test fixture

Figure 1 gives the circuit and physical layout of the test fixture. Figure 2 is a xerox of the fixture. Mixers plug into the fixture and are sandwiched between the pc boards.

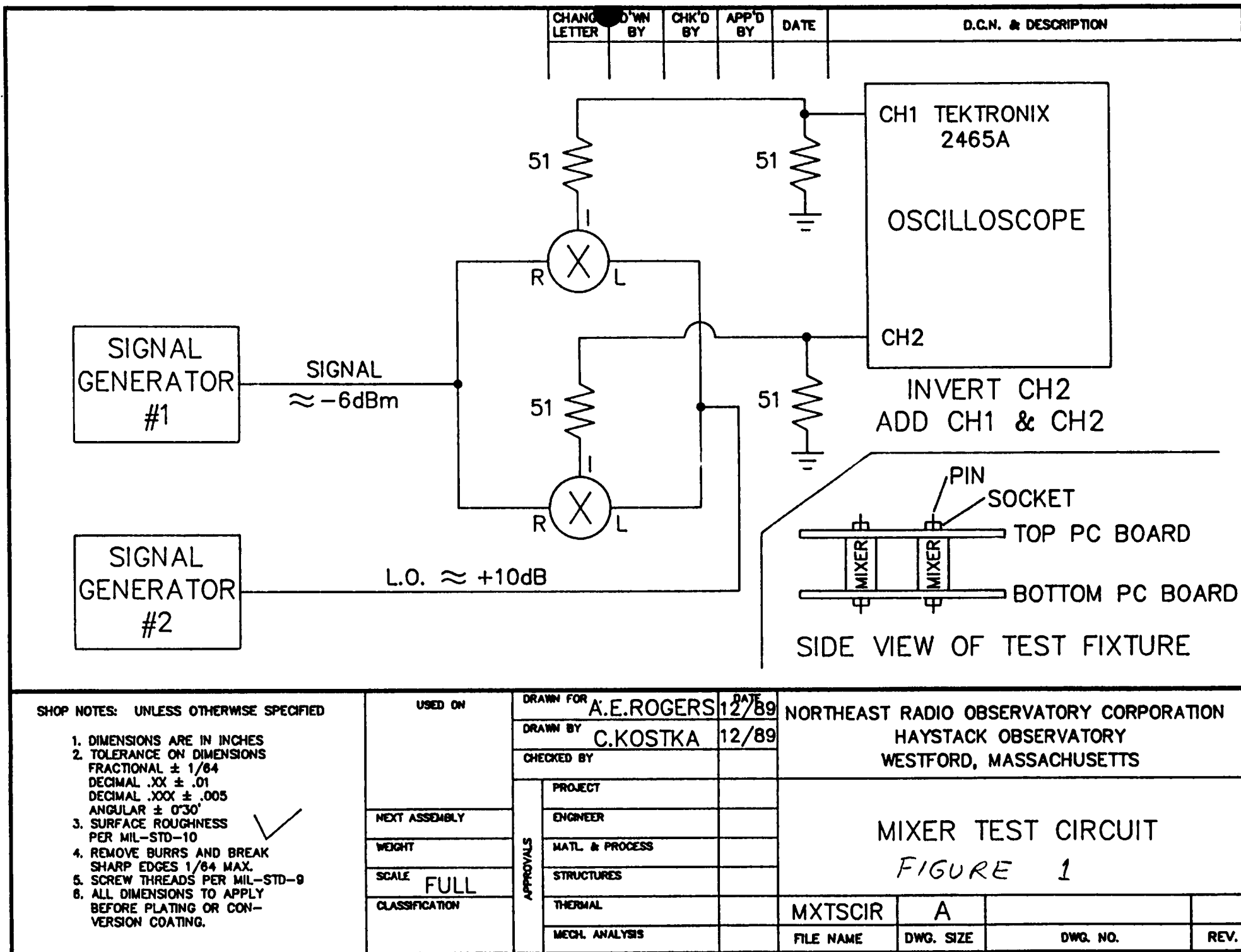
Test results

Two Minicircuits LMX-113, three LMX-149 and four Olektron CDB-223 mixers were available for test. The test results are given in Table 1. The difference of the output voltages was measured at 5 MHz - but in all cases was virtually independent of frequency from 10 KHz to 100 MHz. Only the mixer combinations marked OK are acceptable and could be expected to perform satisfactorily in the SSB submodule.

| Mixer Type | Serial #5 | Output Difference/Output Sum | | | Accept |
|------------|--------------|------------------------------|------------|------------|--------|
| | | 500 MHz | 700 MHz | 900 MHz | |
| LMX-149 | 1 & 3 | -37 | -37 | -27 | No |
| LMX-149 | 1 & 2 | -37 | -37 | -25 | No |
| LMX-149 | 2 & 3 | -43 | -37 | -37 | OK |
| LMX-113 | 1 & 2 | -31 | -31 | -31 | OK |
| CDB-223 | 116 & 118 | -31 | -20 | -16 | No |
| CDB-223 | 20 & 121 | -43 | -38 | -20 | No |
| CDB-235 | 4 & 5 | -29 | -22 | -19 | No |

Table 1.

FIGURE 1.



SHOP NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS ARE IN INCHES
2. TOLERANCE ON DIMENSIONS
 FRACTIONAL $\pm 1/64$
 DECIMAL $.XX \pm .01$
 DECIMAL $.XXX \pm .005$
 ANGULAR $\pm 0'30''$
3. SURFACE ROUGHNESS
 PER MIL-STD-10
4. REMOVE BURRS AND BREAK
 SHARP EDGES $1/64$ MAX.
5. SCREW THREADS PER MIL-STD-9
6. ALL DIMENSIONS TO APPLY
 BEFORE PLATING OR CON-
 VERSION COATING.

USED ON

NEXT ASSEMBLY

WEIGHT

SCALE

FULL

CLASSIFICATION

DRAWN FOR A.E. ROGERS

DATE 12/89

DRAWN BY C.KOSTKA

DATE 12/89

CHECKED BY

PROJECT

ENGINEER

MATL. & PROCESS

STRUCTURES

THERMAL

MECH. ANALYSIS

NORTHEAST RADIO OBSERVATORY CORPORATION
 HAYSTACK OBSERVATORY
 WESTFORD, MASSACHUSETTS

MIXER TEST CIRCUIT
 FIGURE 1

MXTSCIR

A

FILE NAME

DWG. SIZE

DWG. NO.

REV.

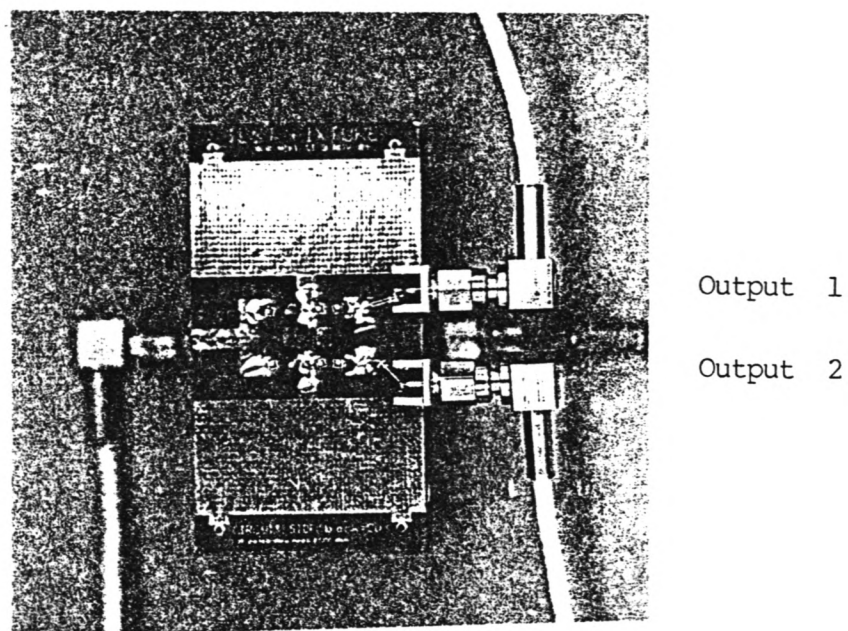
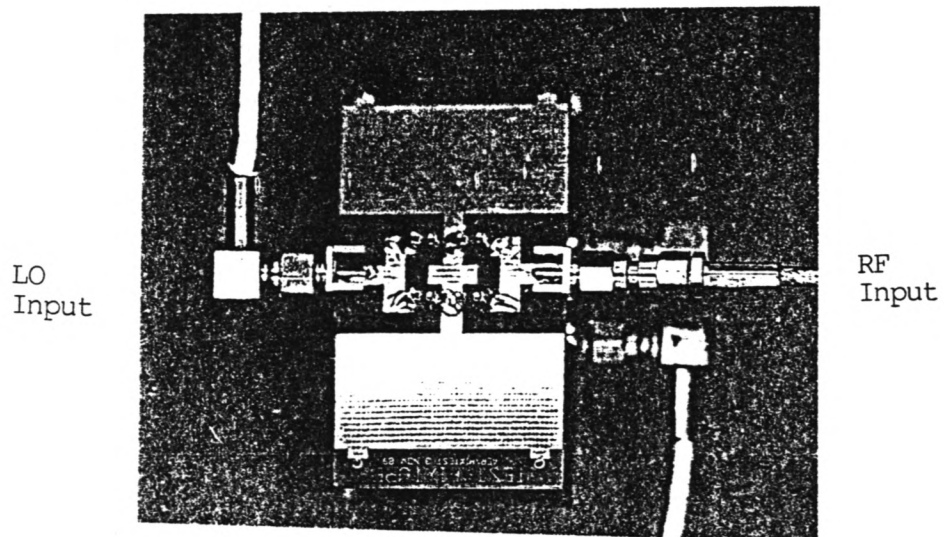


FIGURE 2. Mixer Test Fixture