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**Test Method for Distortion of 2-way Amplifiers Caused
by Insufficient Isolation of Built in Diplex Filter**

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TABLE OF CONTENTS

1.0	SCOPE AND DEFINITIONS.....	1
2.0	INFORMATIVE REFERENCES.....	4
3.0	EQUIPMENT	3
4.0	SET-UP	4
5.0	TEST PROCEDURE	8
6.0	AMPLIFIERS WITH INTEGRAL OUTPUT SPLITTERS.....	9
7.0	RESULTS RECORDING, TEST FREQUENCIES AND LEVELS.....	10

1.0 SCOPE AND DEFINITIONS

- 1.1 The purpose of this document is to establish the standard methodology to measure an amplifier's distortion caused by an upstream signal leaking through the diplex filter that is built inside of the amplifier of a Cable Telecommunications System (see Figure 1).

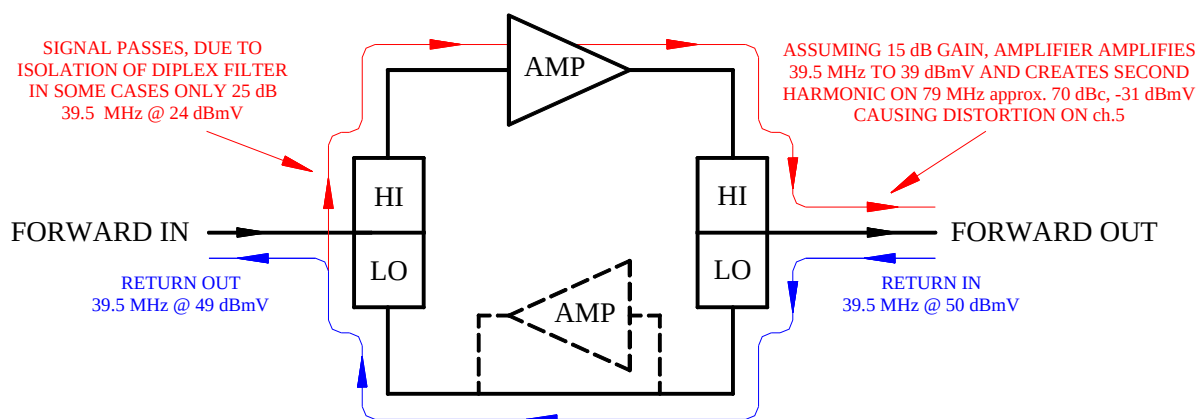


Figure 1

- 1.2 In a two way Cable Telecommunication Systems, amplifiers are commonly used to amplify downstream signals. These amplifiers, are designed as shown in Figure 1. They consist of two diplex filters with amplifier inserted in the high pass path, also known as the forward or downstream path. The low pass path (return or upstream) in most cases needs no amplification, and is used for upstream communication of modems, telephony, etc. In some cases, a return amplifier is used. Upstream communication uses high-level signals, reaching in some cases up to 55 dBmV. Serious problems with second harmonics can arise due to insufficient diplex filter isolation of amplifiers, as it can be seen in Figure 1. Diplex filter isolation is usually the worst at the end of the passband, for 5-40 MHz amplifiers at 38-40 MHz, for 5-42 MHz amplifiers at 41-42 MHz. If high-level signals are applied at these frequencies, second harmonics can be created causing distortion on the corresponding channel. If the amplifier also has a built in return amplifier, distortion problems can be even more serious, since the harmonic levels are higher by the gain of the return amplifier.