The **T303 UX Converter** is the down converter for the Ku, K, Ka and Q-band receivers. Only one receiver is connected to the **UX Converter** at a time via system band switches. Each receiver provides an LCP and RCP 8–18 GHz wideband output, converted into two 8–12 GHz IF's. RCP forms IF-A/B and LCP forms IF-C/D.

**Local Oscillators.** The **T303** requires two LO's (LO1 and LO2) from the **L301 12-20 GHz Synthesizers** for Ku-band, and only LO2 on the higher bands. For K, Ka and Q-bands, LO1 is used by the respective receiver. LO1 and/or LO2 are internally doubled to 24–28 GHz for the T303 mixers. The signal flow and conversion scheme differs, depending upon the receiver selected.

**Ku-band (12–18 GHz):** The 12–15 GHz portion is downconverted to 8–12 GHz IF-A/C while the 15–18 GHz component is downconverted to another 8–12 GHz IF, IF-B/D. Both LO1 and LO2 are used by the UX Converter for Ku band down conversion.

**K, Ka and Q-bands (8–18 GHz):** The outputs from these receivers are downconverted by LO1 to wideband 8–18 GHz inputs to the UX Converter. In the **UX Converter**, the 8–12 GHz portion is band-pass filtered to form the IF-A/C outputs, called the "X-Direct Path." The 12–18 GHz portion is likewise selected by filters and down converted to 8–12 GHz IF-B/D, called the "Ku converted path." Which 4 GHz component of the 12–18 GHz portion that is downconverted to the 8–12 GHz IF is a function of the LO2 frequency.

**Power Detectors.** There are four power detectors in the **UX Converter**. Two monitor LCP and RCP power prior to the mixers for diagnostic purposes, such as detecting the presence of strong unwanted signals or ensuring none of the previous active stages are in gain compression. Two additional power detectors monitor the LO1 and LO2 power, after doubling to 24–28 GHz. This is used to confirm the proper LO mixer injection and the LO doubler(s) are functioning properly. There will be no LO1 power in K, Ka or Q-bands.

**Transfer Switches.** Four mechanical transfer switches determine the source for IF-A,B,C and D, that is, whether via the "X-direct path," the "Ku converted path," or IF-A=IF-B and IF-C=IF-D for diagnostics.

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**Fig. 1** – The **T303 UX Converter** (bottom box) is located directly beneath the Ku, K, Ka and Q-band receivers in the antenna Vertex Room.

**Fig. 2** – Functional Block Digram (one polarization shown)