

### 3. Equipment Overview

Fiber Optic, Uplink, Band Selective UHF Mid Band Booster Amplifier Part Number 60-274701 is built into an 8U, 19" rack mount shelf. The amplifier is used to filter and amplify the signal levels of one UHF band, 485.3MHz to 486.8MHz; in the Uplink direction only.

The Uplink Optical signal is received from Fiber Optic Transmitter Part Number 60-275101 via Fiber Optic cable at the FC/APC port labelled "F/O" (annotated "A" in 3.4.); the optical Uplink signal then enters Fiber Optic RX Module 20-005501 which demodulates the Optical signal to RF.

The RF signal then passes through a Bandpass Filter 02-010801 tuned to pass the Uplink band and to reject out-of-band noise; after leaving the Bandpass filter the Uplink signal passes through the Variable Switched Attenuator 10-000701 which can introduce up to 30dB of signal attenuation if required. The attenuator is controlled by a set of four toggle switches (annotated "E" in section 3.5.) on the front panel of the Amplifier shelf; each switch is clearly marked with the attenuation it provides, and the total attenuation in-line is the sum of the values switched in.

After leaving the switched attenuator the Uplink signal passes first through the AGC Attenuator Module 17-016401 (which is controlled by AGC Detector Module 17-019801 fitted further on in the RF path) and then through a Low Noise Amplifier 11-007402 which provides 30dB of gain.

The Low Noise Amplifier is followed by a 25W Power Amplifier 12-026902 which provides 37dB of gain and then the Uplink signal passes through the AGC Detector Module 17-019801 which regulates the gain level by adjusting AGC Attenuator Module 17-016401.

The AGC Detector Module monitors the RF level being delivered by the power amplifier, and when a certain threshold is reached it begins to increase the value of the AGC Attenuator Module to limit the RF output to the (factory set) threshold. Therefore overloading of the power amplifier is avoided.

After passing through the AGC Detector Module the Uplink path passes through a second Bandpass Filter 02-010801 to further reject out-of-band noise and then through VSWR Monitor 21-003207.

Upon leaving the VSWR Monitor the Uplink signal exits the Amplifier shelf for the Uplink Antenna System via the N type port labelled "RF Base" (annotated "F" in section 3.5.).

The Amplifier is powered from mains AC at 110V which drives an internal 400W PSU module providing 24V DC for the power amplifier; a DC/DC converter provides 12V DC for the remaining active modules.

The Amplifier has an alarm system; both of the amplifier modules, the PSU, DC/DC converter, the F/O RX and the VSWR Monitor modules carry their own voltage-free, dry contact alarm relay outputs which are summed at the 15 way "D" alarm output connector on the rear of the case (annotated "L" in section 3.5.).