1.3. Options

- Test Pattern/ID Test Generator:
  The optional Test Generator provides:
  - SMPTE RS-170A Color Bars *(EBU Pattern)*
  - A 16-character programmable ID: (This ID can be placed in the Vertical Interval and Genlocked to the incoming Video signal)
  - A Multiburst/Linear Ramp test pattern
- Pan & Tilt Controller
- Remote Control Software:
  The NEWSCASTER VT1 can be full monitored and controlled from an IBM Compatible PC through a RS232C/RS422/RS485 port.

1.4. Accessories

NEWSCASTER VT1 transmitters are shipped with an AC power cord and this manual.

With the addition of a modem, the NEWSCASTER VT1 can pass DS3 or a variety of digital signals. The NEWSCASTER VT1 can accept PSK, QPSK, 8PSK, 16QAM, and COFDM signals directly through the 70 MHz input connector with no internal modifications.

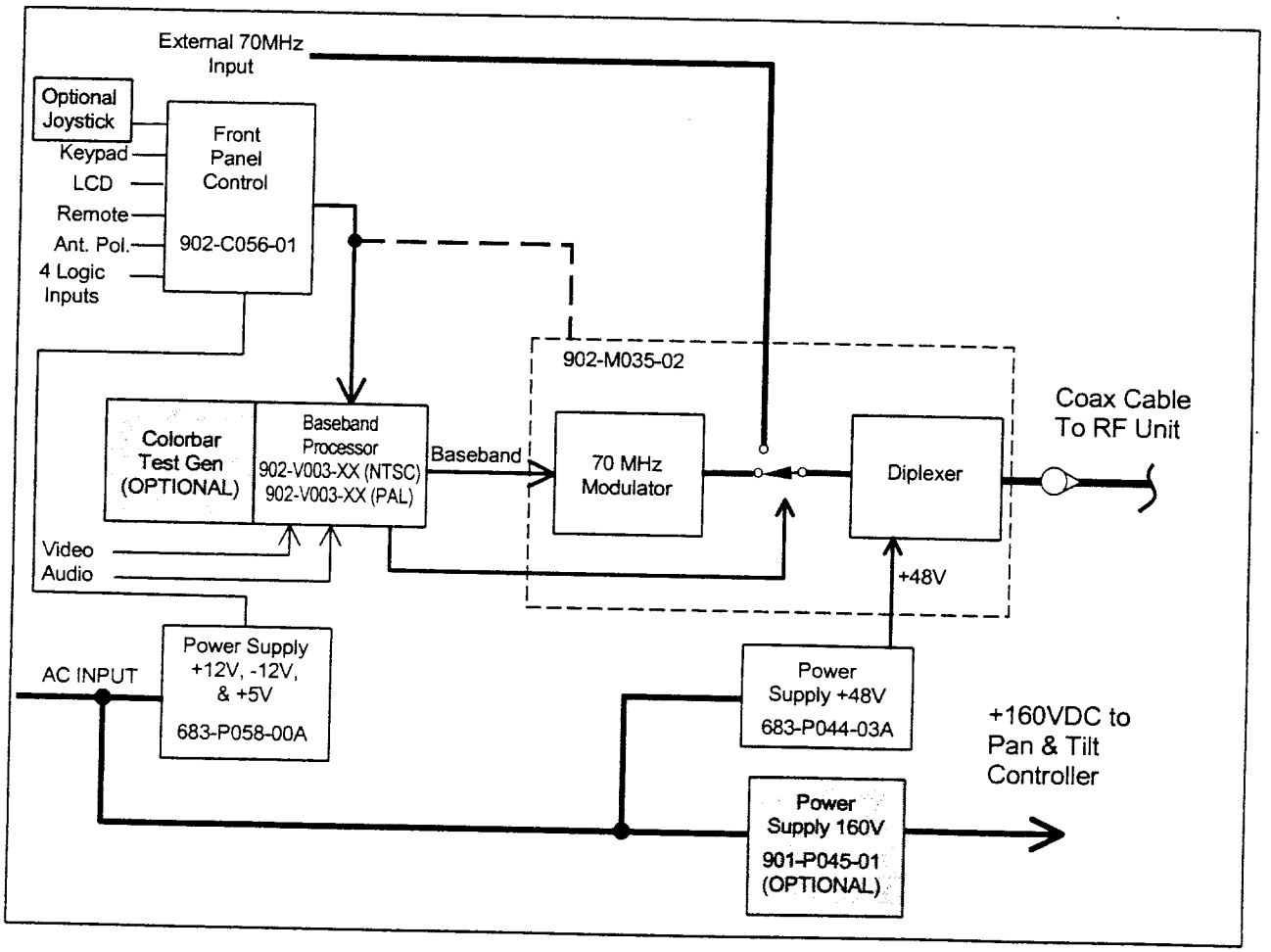

Figure 1-1 NEWSCASTER VT1 Control Unit Block Diagram

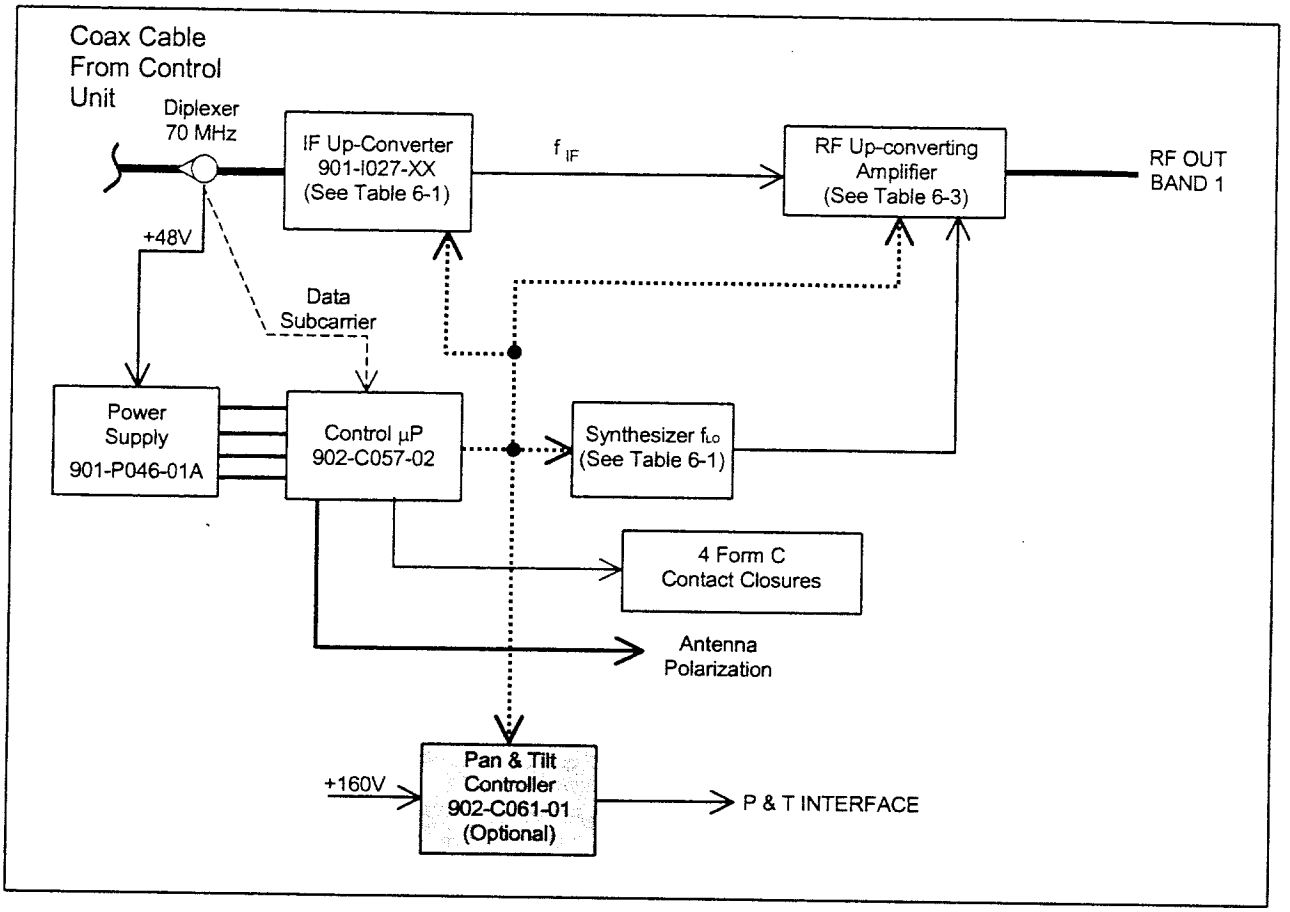

Figure 1-2 NEWSCASTER VT1 Single Band RF Unit Block Diagram

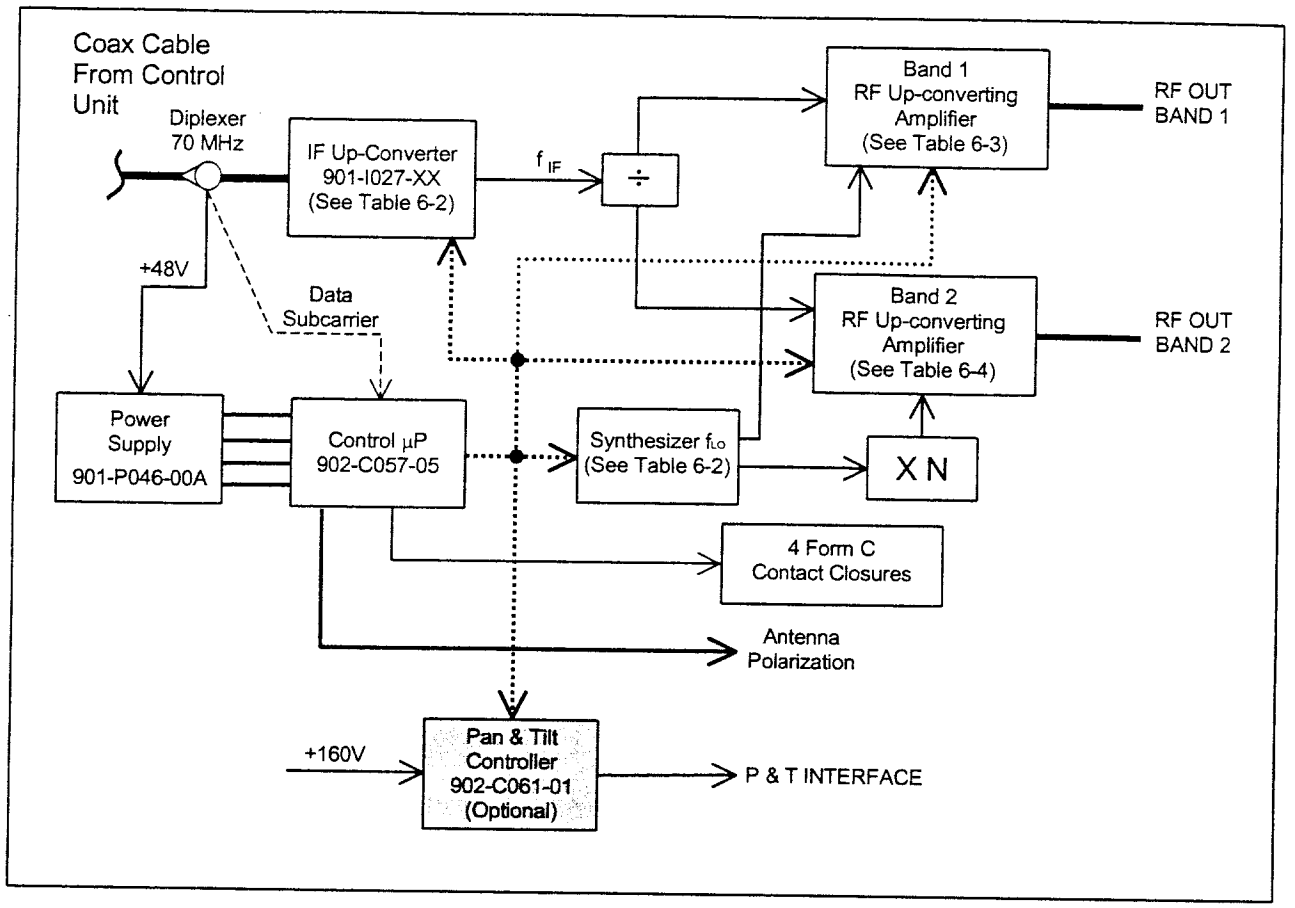

Figure 1-3 NEWSCASTER VT1 Dual Band RF Unit Block Diagram

6.2.5. RF Unit Control Board

The RF Unit contains a control board that is used to control the RF Unit. These controls include the following:

- Setting antenna polarization
- Power amp selection
- RF level (High or Low power)
- Setting the RF frequency
- Power supply voltage monitoring
- RF Unit trouble condition monitoring
- Relay output control

This control board receives all of its commands from the Smart Display in the Control Unit.

6.2.6. IF and RF Microwave Up-Converter and Power Amplifier

The IF signal from the Control Unit is passed through a diplexer to remove the DC from the signal. The IF signal is passed to the IF Up-Converter and the +48 VDC is routed to the RF Head power supply. Two up-converters are used to convert the 70 MHz modulated signal from the Control Unit to the final RF output frequency.

The IF Up-Converter up converts the 70 MHz input signal to the 1500 MHz frequency range. The IF output frequency may differ depending on the final RF output frequency.

The RF Microwave Up-Converter and Power Amplifier up converts the 1500 MHz signal to the final microwave frequency and amplifies it to the required power output level.

6.2.7. IF Up-Converter (P/N 901 I027-XXB)

A block diagram of the IF Up-Converter is shown in Figure 6-12. The 70 MHz input signal from the Control Unit is amplified in the AGC amplifier and inputted to the mixer. This signal is mixed with the synthesizer frequency to produce the 1500 MHz IF. The IF signal is band limited by the Band-Pass-Filter to remove the synthesizer signal. The IF signal is rectified and fed back to the AGC amplifier to maintain a constant -5dBm IF output level as the 70 MHz input signal varies.

6.2.8. RF Microwave Up-Converter (See Tables 6-3 and 6-4)

A block diagram of the RF Up-Converter is shown in Figure 6-13. The 1500 MHz input signal from the IF Up-Converter input is amplified in the AGC amplifier and inputted to the mixer. This signal is combined with the microwave synthesizer frequency to produce the final RF output signal. The RF signal is band limited by the Band-Pass-Filter to remove the synthesizer signal. The filtered RF signal is amplified to the final desired output power level. The RF signal is rectified and fed back to the AGC amplifier to maintain a constant RF output level as the 1500 MHz input signal varies. For FM signals, the AGC is set to full gain to run the PA in a saturated mode. For all digital signals, the AGC is enabled backing the amplifier out of saturation.

6.2.4. Frequency Synthesizer

The Frequency Synthesizer assembly consists of a phase-lock loop, and a low noise microwave oscillator programmed by an internal microprocessor. The front panel microprocessor communicates with the synthesizer microprocessor telling it what frequency to attain.

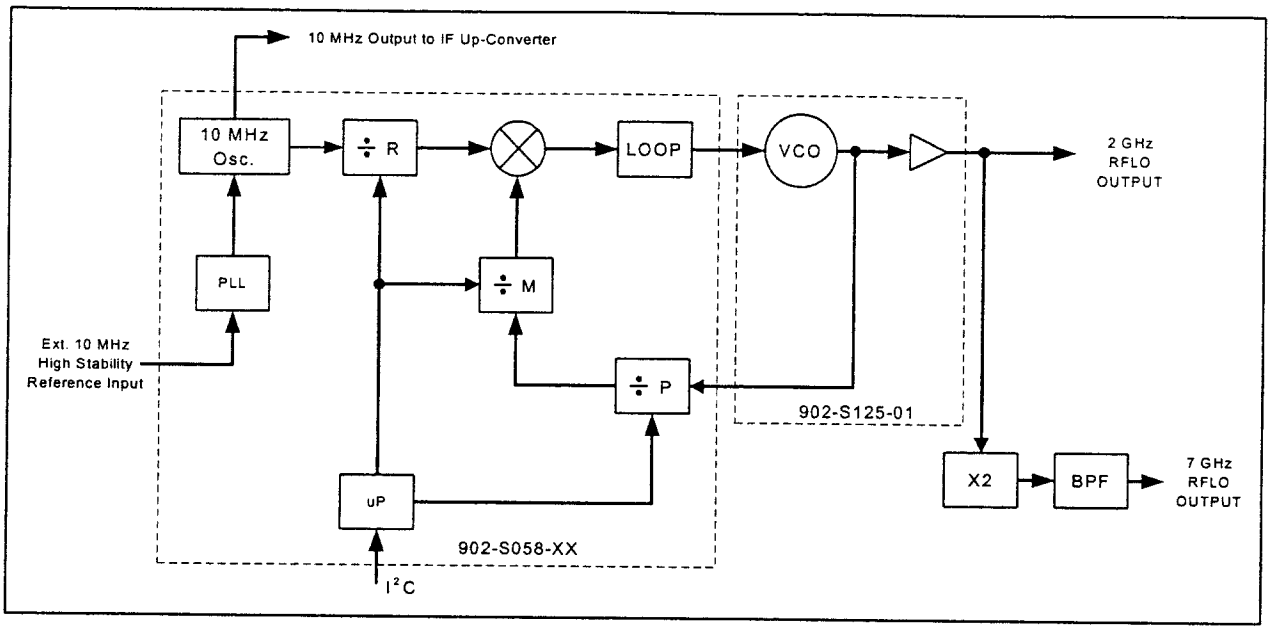

Figure 6-7 Simplified Block Diagram RFLO Low Noise Microwave Synthesizer

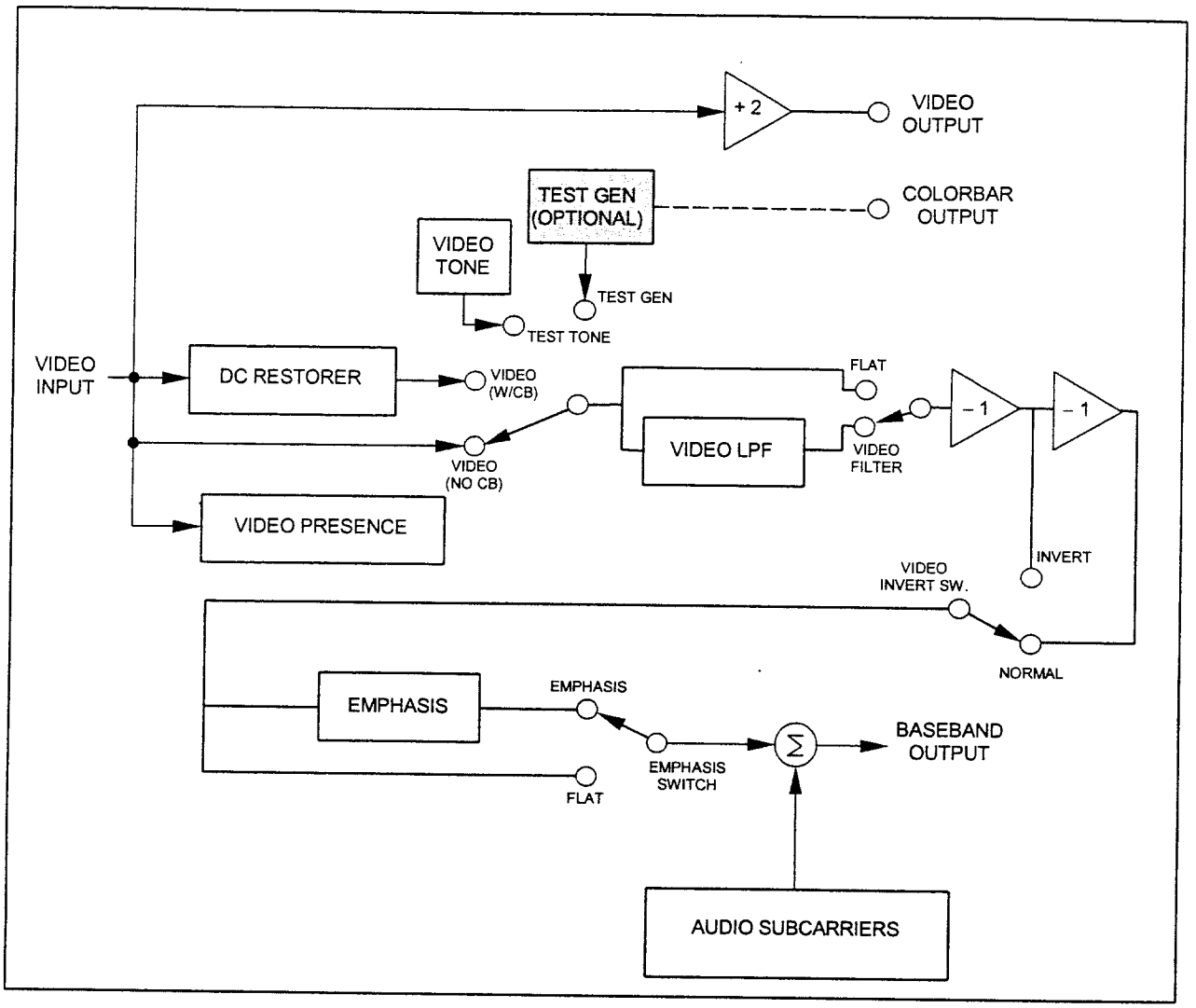

Figure 6-4 Video Modulator Block Diagram

In units equipped with the Test Pattern/ID Generator option, the video signal is first DC-restored to remove any DC offset. This is necessary when the ID is placed in the vertical interval to maintain proper DC levels. The DC restorer is followed by a three-position electronic switch. This switch selects between three input signals: video, color bars or the 761.5 kHz *(1,512 kHz for PAL)* video test tone. The input is switched from the video source to the Test Pattern/ID Generator input during the ID vertical interval. The video DC restorer is automatically enabled when the Video with ID is selected from the front panel.

The video at the video input of the baseband processor is monitored by the microprocessor. This monitoring point detects the presence of video, black video or video sync. The microprocessor utilizes this information combined with the Standby Mode selection receiver from the *Smart Display* to control the standby modes. These modes were described in Section 5.1.

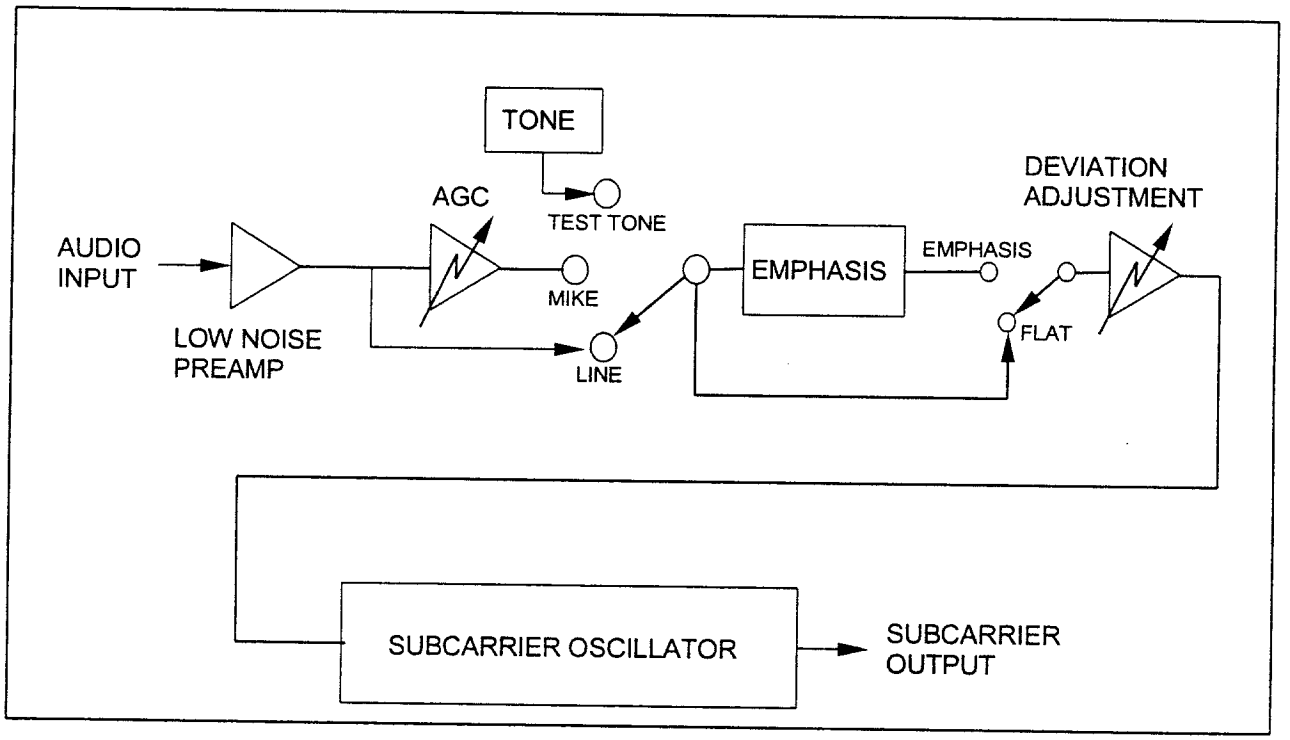

Figure 6-3 Audio Subcarrier Modulator Block Diagram

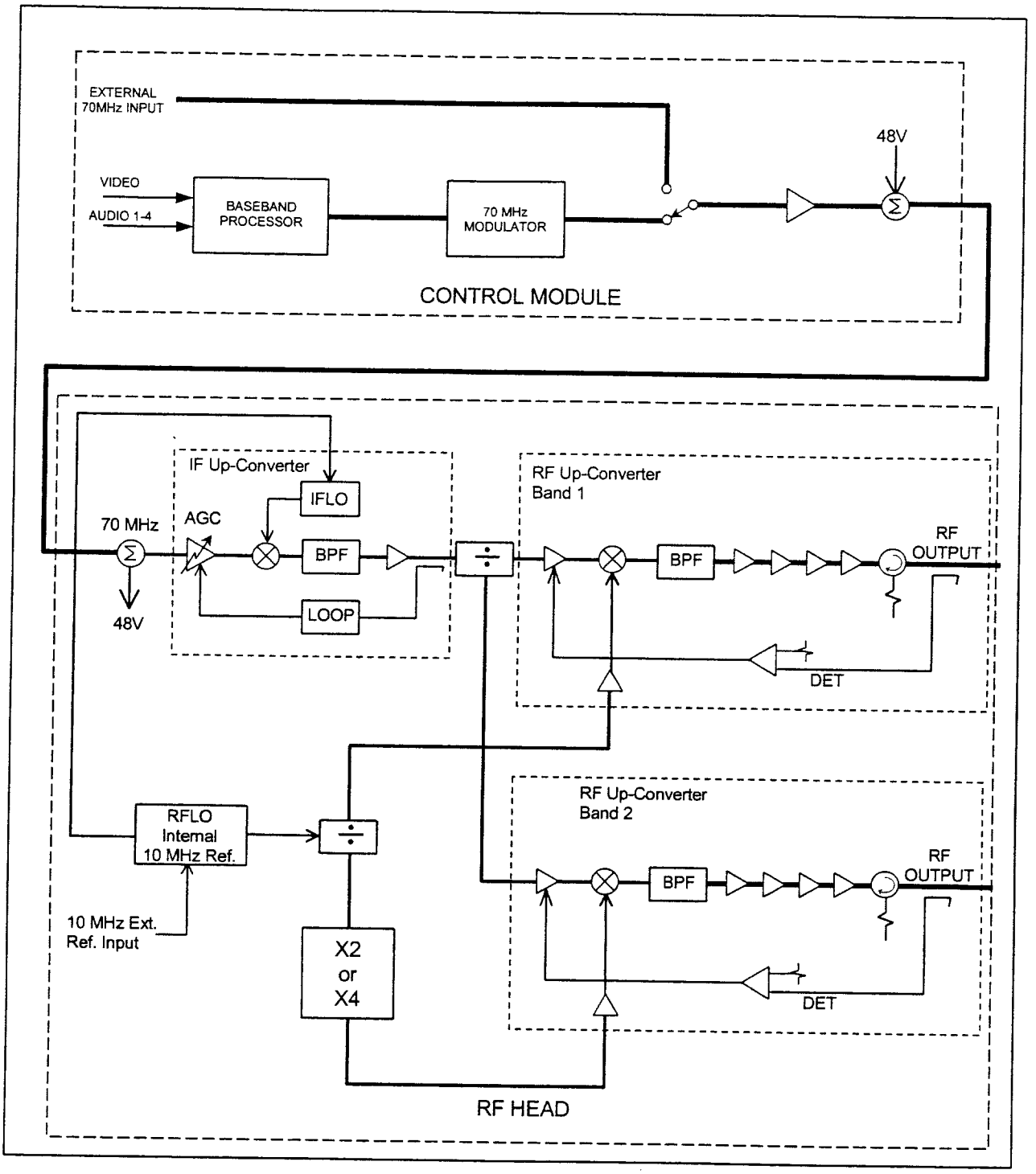

Figure 6-2 Dual Band Transmitter Functional Block Diagram

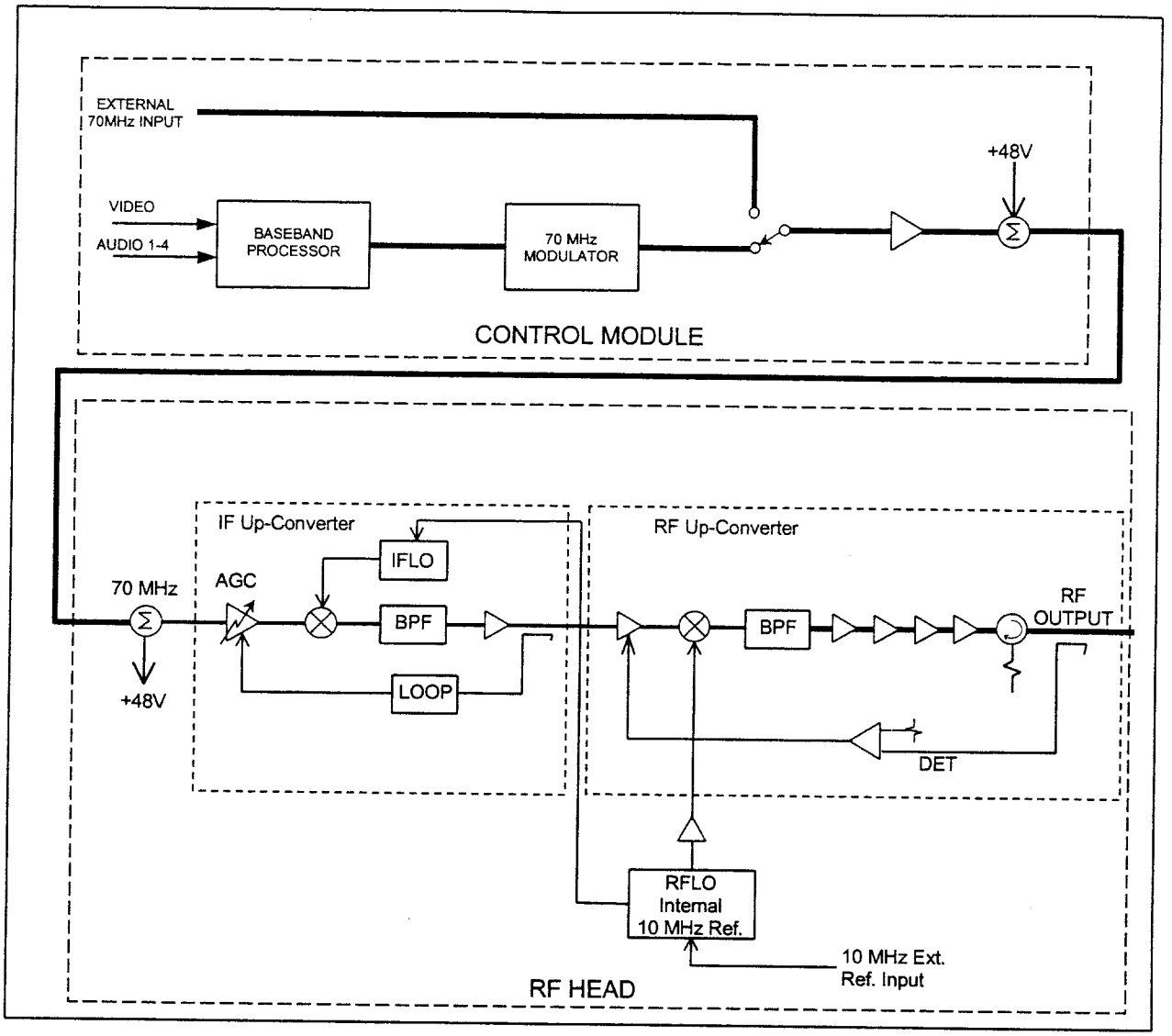

Figure 6-1 Single Band Transmitter Functional Block Diagram

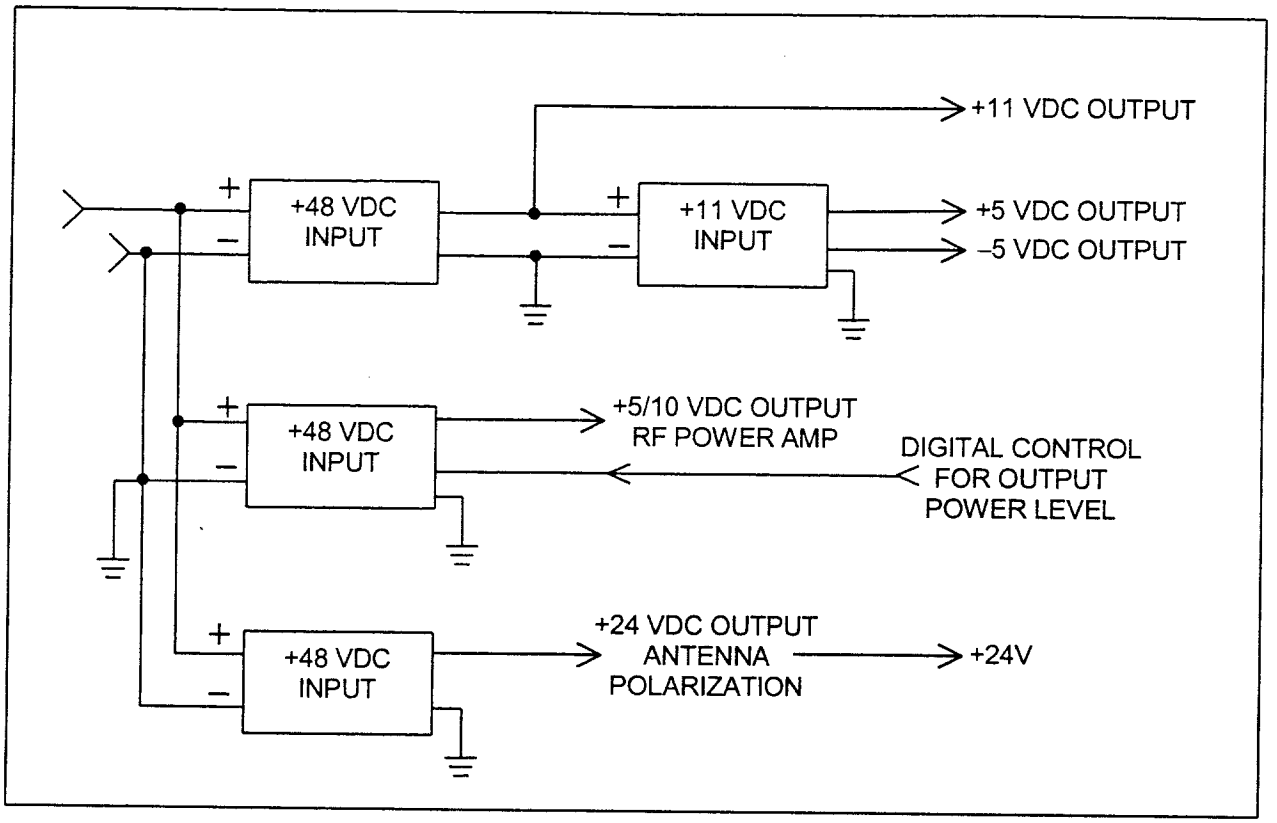

Figure 6-13 NEWSCASTER VT1 RF Head Power Supply Block Diagram