



IRIG–106 Chapter 7

“A User’s Case”

14 May 2015

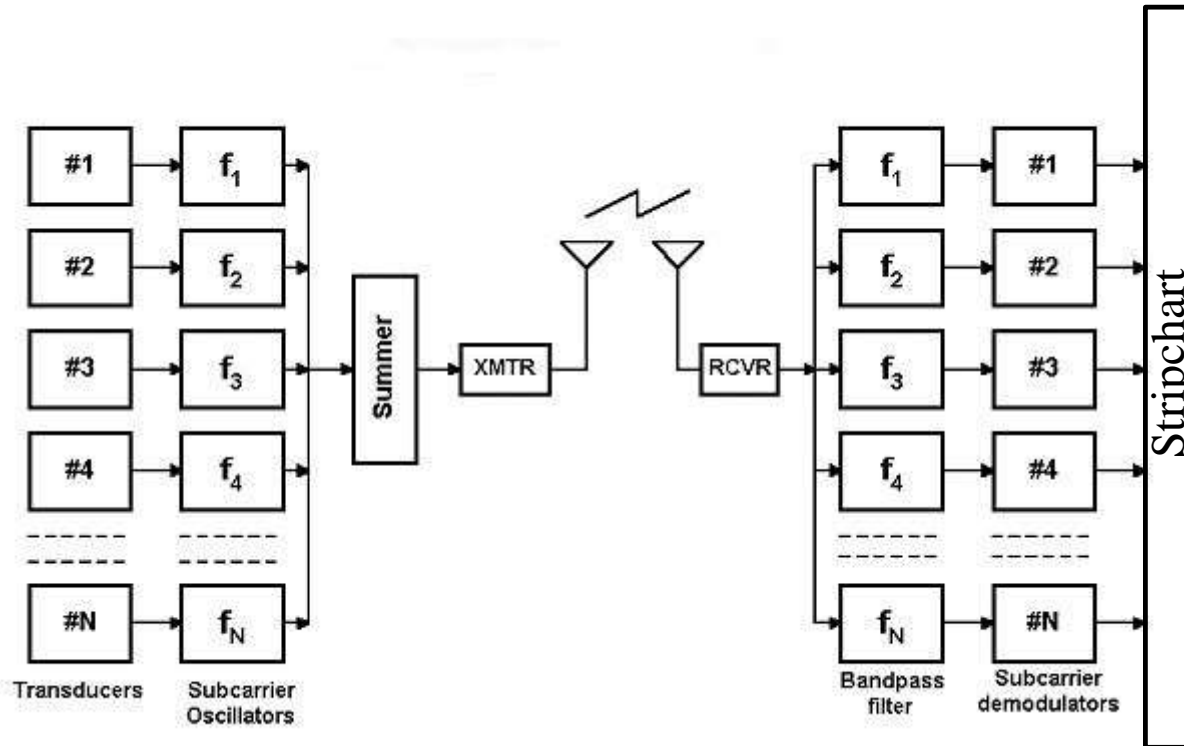
Tab M. Wilcox



Where We Came From



Frequency Division Multiplexing



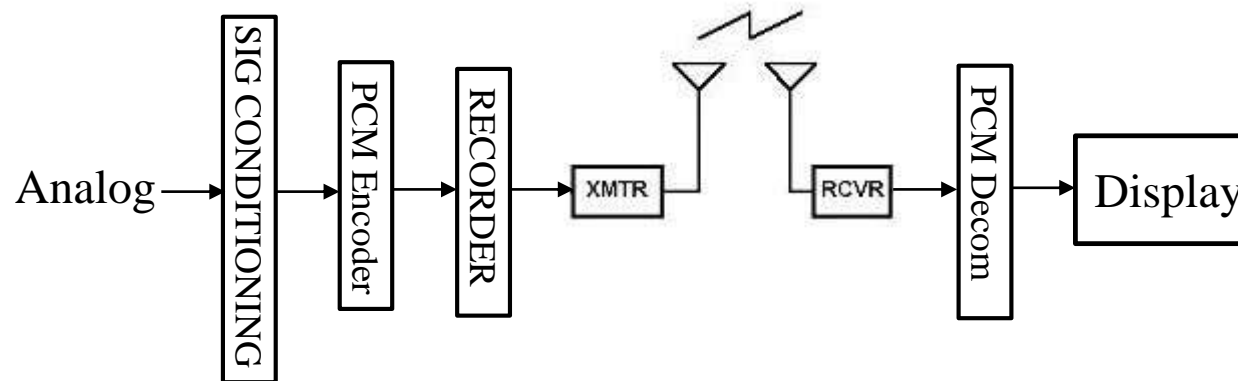


Disadvantages

- No on-board record capability.
- Limited number of data channels.
- Accuracy not as good as other multiplexing methods.
- More susceptible to loss of data in low signal-to-noise environments.
- Tedious daily calibration of de-modulators.



Time Division Multiplexing



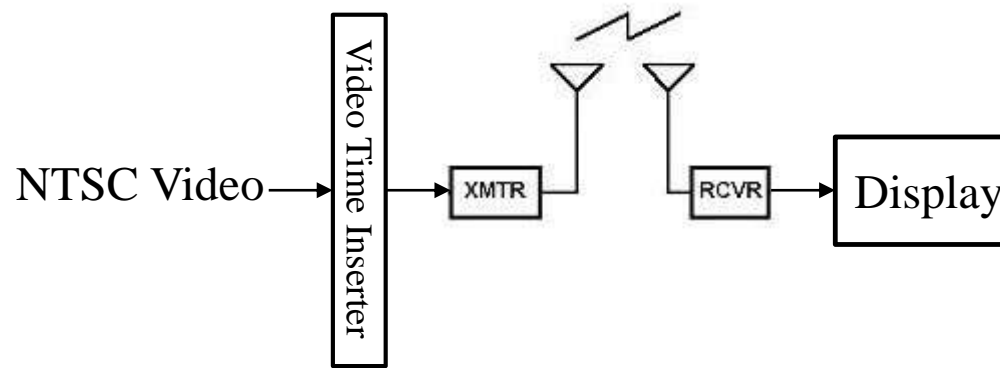


Disadvantages

- Home grown signal conditioning boxes were limited to 16 channels.
- Analog signals only.
- Limited number of PCM words especially if signals required super commutation to achieve proper frequency response, due to low bit rates of encoder.
- Limited record time.



NTSC Video



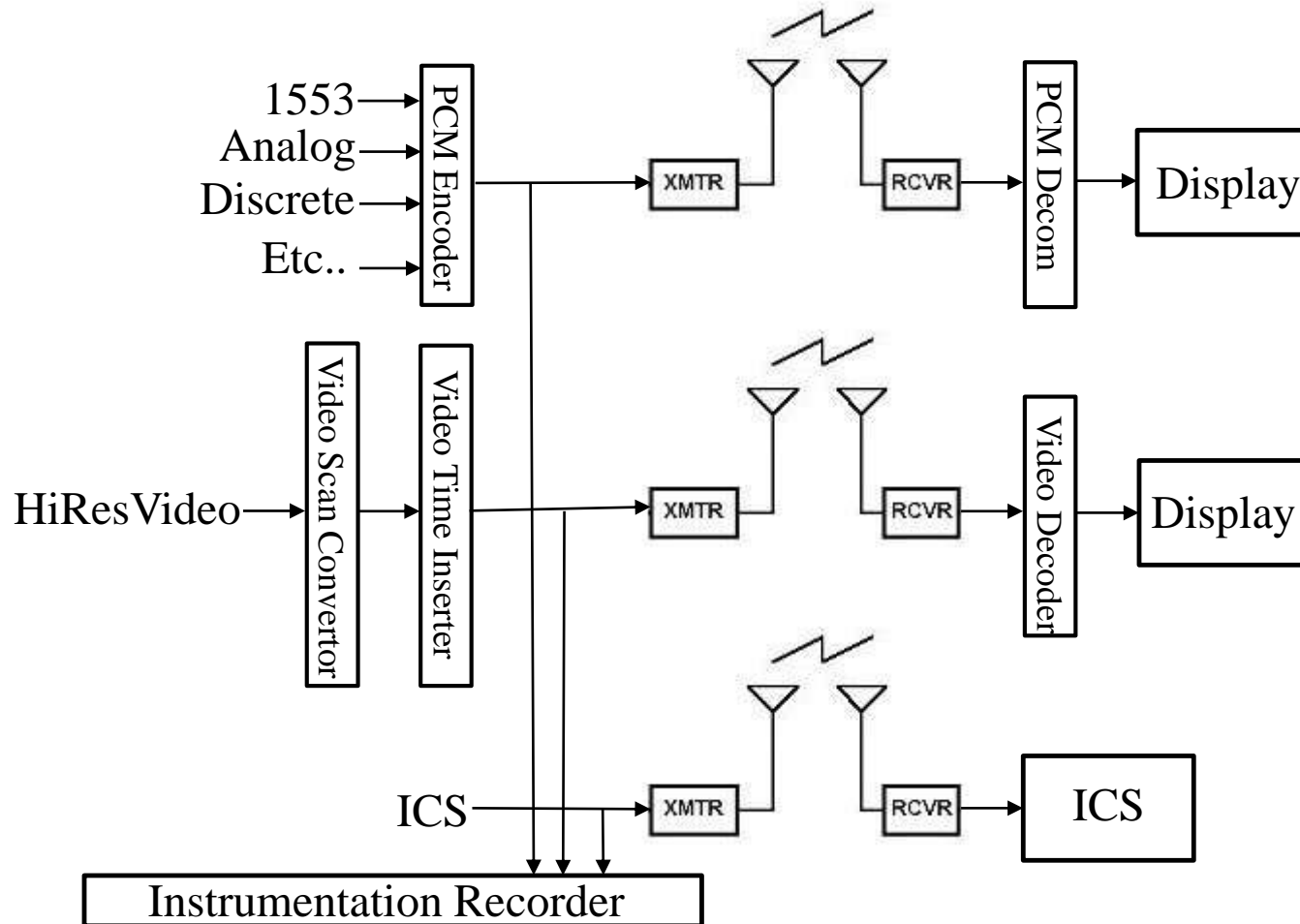


Disadvantages

- NTSC video only.
- Not recorded on-board.



Typical Aircraft Instrumentation Before Chapter 7





Disadvantages

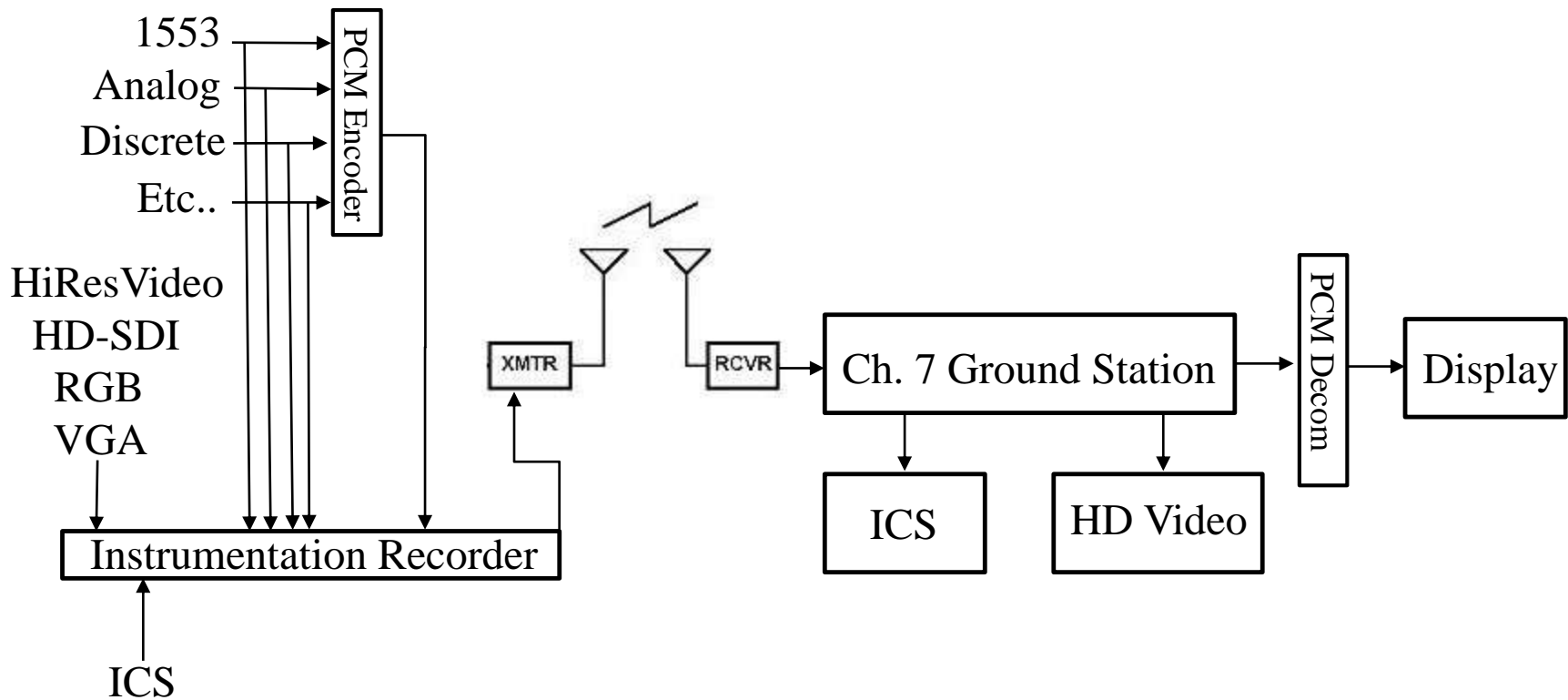
- One transmitter, receiver, and frequency needed for each data, video, and ICS stream.
- More spectrum use.
- Amount of hardware needed in the aircraft and on the ground.



Where We Are Today



Typical Aircraft Instrumentation Using Chapter 7





Advantages

- Smaller equipment footprint on the aircraft resulting in easier Airworthiness Release.
- Less equipment required on the ground.
- Any signal the instrumentation recorder is capable of recording can be extracted on the ground.
- Multiple signal types can be transmitted on one frequency, only limited by max bit rate and available spectrum.



Advantages (continued)

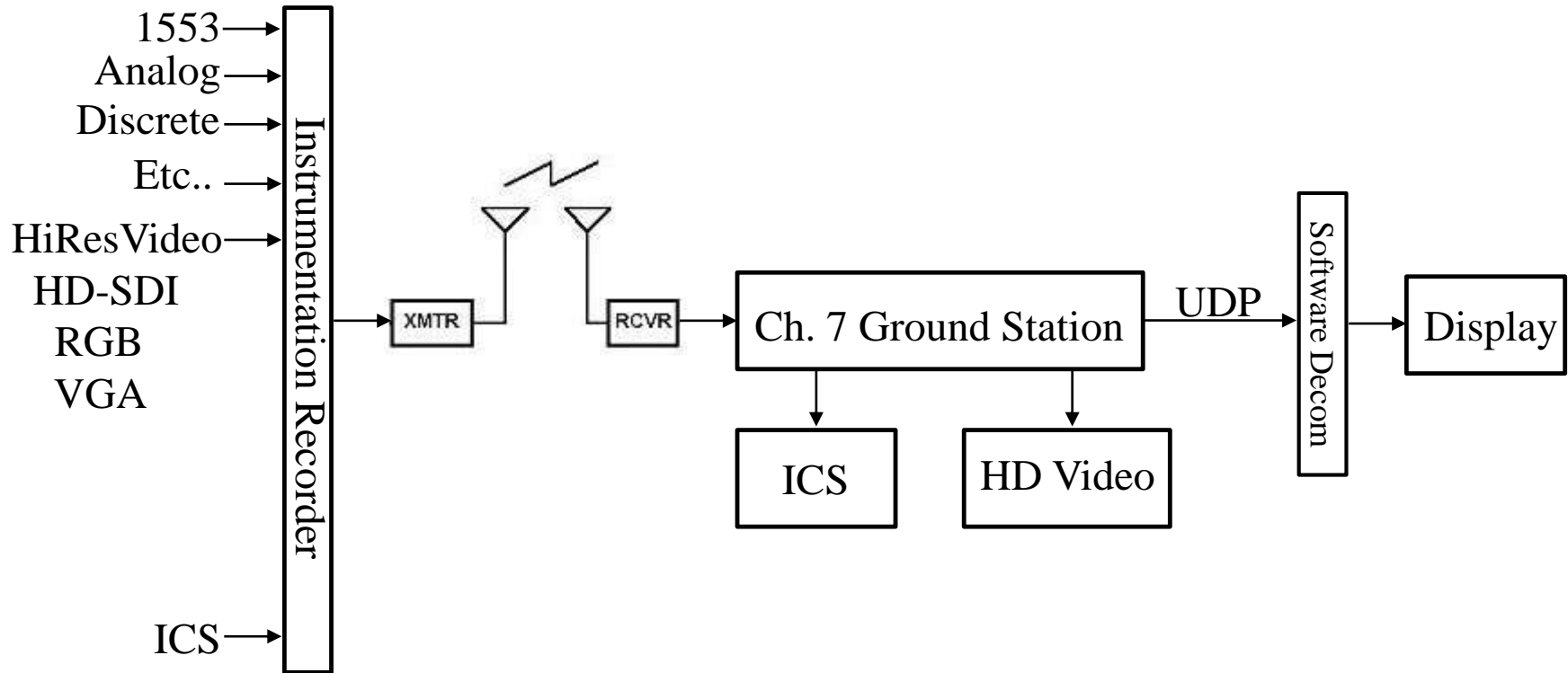
- Our current Chapter 7 module can transmit three separate PCM streams.
- The TM streams are Chapter 4 compliant so existing Chapter 4 hardware can be used.



Where We Are Going



Proposed Aircraft Instrumentation Using Chapter 7





Advantages

- PCM encoder not required on the aircraft resulting in an even smaller equipment footprint on the aircraft.
- Elimination of hardware based decommutation equipment.
- UDP stream easily routable to customer customized displays.
- Approximate 60% reduction in hardware components required to support test.



- Yuma Proving Ground has owned Chapter 7 capable equipment for about two years.
- During this time it has been used to support several tests on both fixed and rotary wing aircraft with great results.
- On a recent test, we transmitted four HD video signals, a Chapter 4 PCM frame, and ICS from the test item, using two transmitters



Questions??