WILEY, REIN & FIELDING

1776 K STREET, N.W.
WASHINGTON, D.C. 20006
(202) 429-7000

DOCKET FILE COPY ORIGINAL

EX PARTE OR LATE FILED

WRITER'S DIRECT DIAL NUMBER
202-828-3256

FACSIMILE
(202) 429-7049

March 11, 1996

HAND DELIVERY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

RECEIVED

MAR 12 1996

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Re: MM Docket No. 87-268
Ex Parte Presentation

Dear Mr. Caton:

Enclosed are copies of materials provided today to Commissioner Susan Ness on matters related to the pending proceeding in MM Docket No. 87-268. An original and two copies of this letter and the enclosures thereto are submitted. A copy of this letter is being sent simultaneously to Commissioner Ness.

Respectfully submitted,

Kevin J. Martin

cc Commissioner Susan Ness (w/o enclosure)

No. of Copies rec'd 0+2
List ABCDE

EX PARTE OR LATE FILED

WILEY, REIN & FIELDING

1776 K STREET, N.W.
WASHINGTON, D.C. 20006
(202) 429-7000

WRITER'S DIRECT DIAL NUMBER
202-828-3256

FACSIMILE
(202) 429-7049

March 11, 1996

RECEIVED
MAR 12 1996
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Commissioner Susan Ness
Federal Communications Commission
1919 M Street, NW
Room 832
Washington DC, 20554

Re: ATV Spectrum Briefing Booklet

Dear Commissioner Ness:

Enclosed at your request are three copies of the ATV spectrum briefing booklet we prepared. If you or your staff have any questions, or if you require additional copies, please feel free to call Mimi Dawson at 202-429-7034 or me 202-828-3256.

Sincerely yours,

Kevin J. Martin

Kevin J. Martin

Enclosure

SPECTRUM

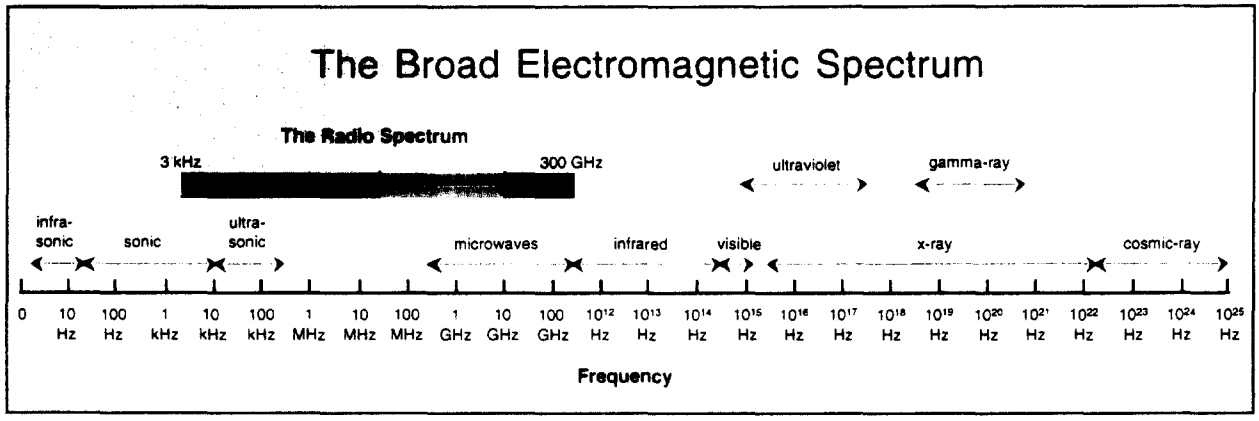
A Presentation by

Wiley, Rein & Fielding

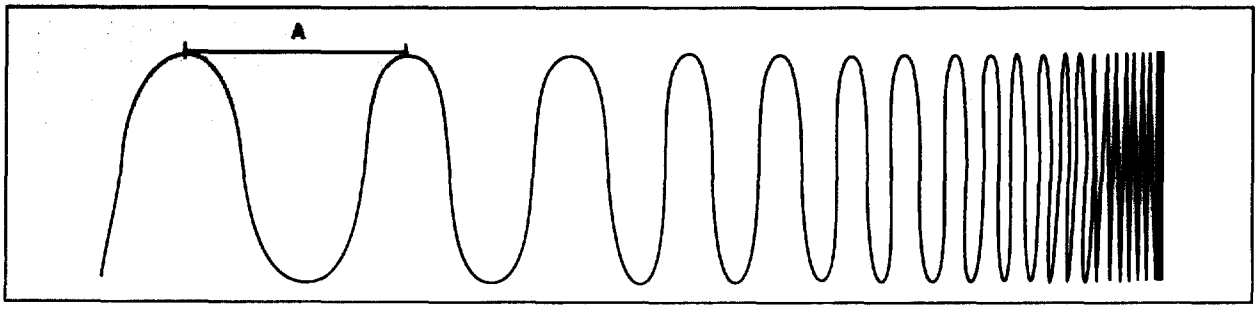
March, 1996

SPECTRUM

- *Spectrum* is the range of electromagnetic waves that pervade our environment.
  - It is naturally occurring.
  - It is divided up according to frequencies.



- *Frequencies* are the measurements of how rapidly these electromagnetic waves are moving.



- For example, imagine that at "A" on this chart one electromagnetic wave occurs every second or *hertz*. This frequency would be referred to as the 1 Hz frequency.

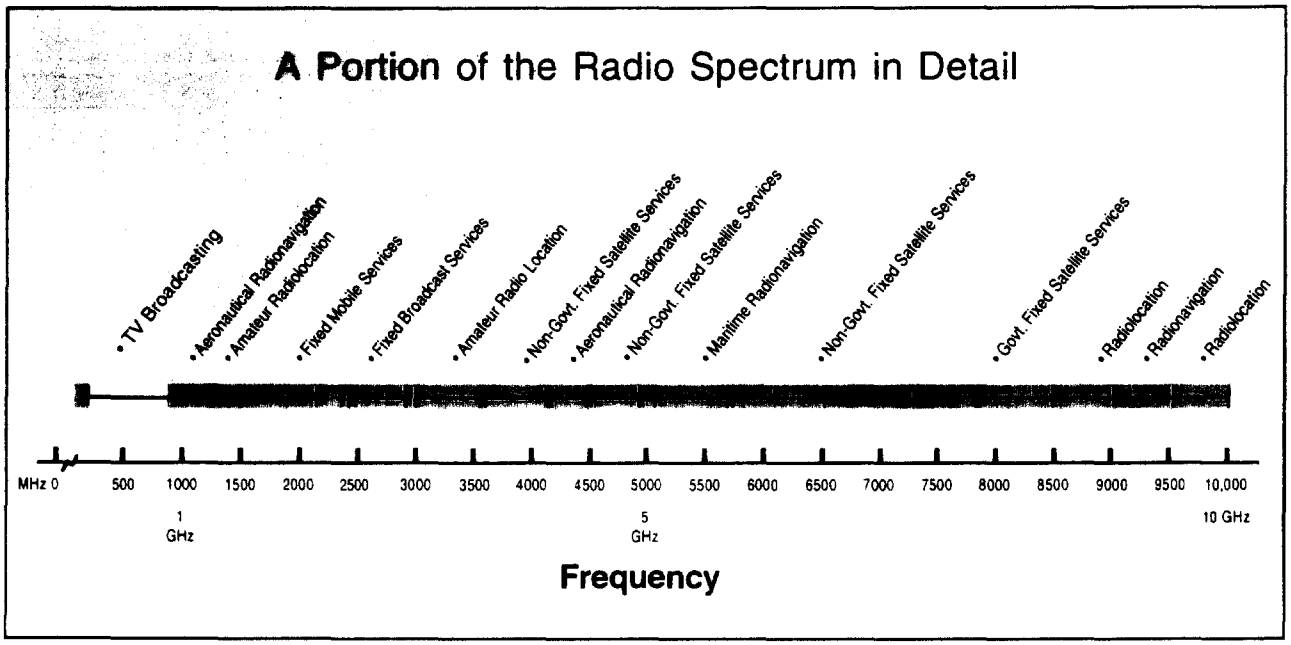
- At lower frequencies, there are fewer electromagnetic waves per second. At higher frequencies, there are more.

...SPECTRUM

- For the delivery of telecommunications services, radio frequencies are not interchangeable because the technical characteristics of a frequency depend on that frequency's location in the spectrum. Thus, certain telecommunications technologies are better suited to some parts of the spectrum than others.
  - Broadcasting typically uses the lower frequencies. Characteristics of these lower frequencies include:
    - ability to travel greater distances;
    - ability to handle a lower information content;
    - need for bigger antenna to receive signals; and
    - ability to penetrate buildings easily.
  - Cellular, Paging and PCS typically use the higher frequencies. Characteristics of these higher frequencies:
    - cannot travel as far as lower frequencies;
    - can handle greater information content;
    - do not require large antenna to receive signals; and
    - cannot penetrate buildings easily.

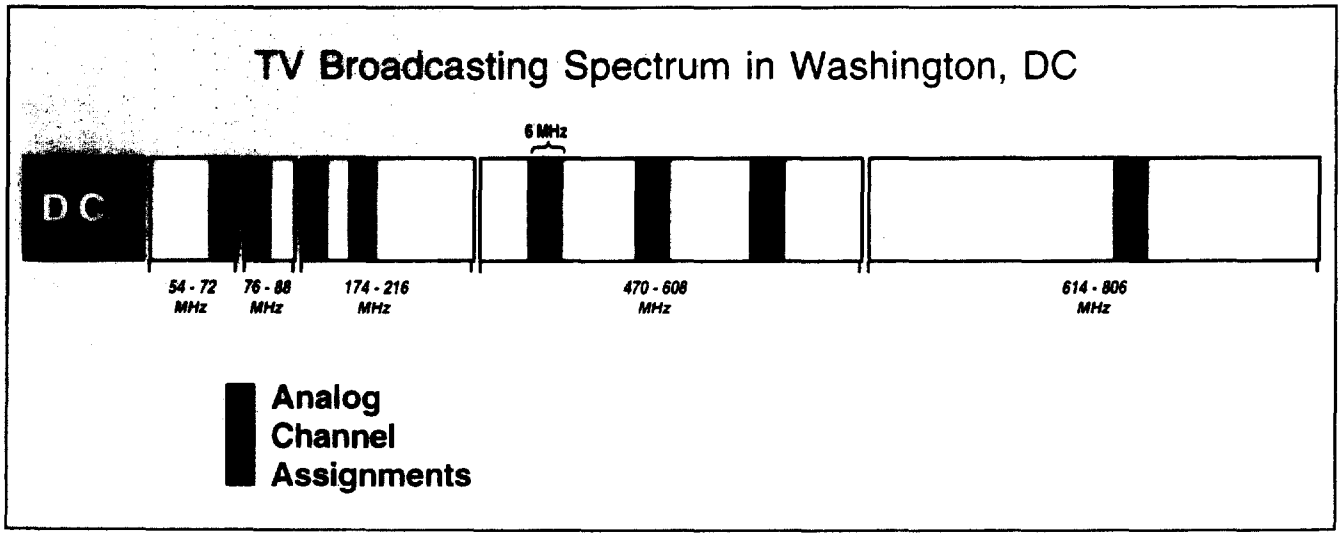
...SPECTRUM

- The chart below summarizes how a portion of the radio spectrum is currently allocated. The highlighted portion of the chart (marked TV Broadcasting) is the spectrum that has been allocated to the television broadcasting service since 1945.



...SPECTRUM

- Within the bands of spectrum devoted to television broadcasting, channels are assigned to individual broadcasters in 6 MHz slices. Within a geographic area, analog TV channels are separated by buffer frequencies to protect the broadcasts from interference (known as "adjacent channel interference").
- For example, the spectrum allocated to television broadcasting in the Washington, D.C. area is assigned as indicated in the chart below.



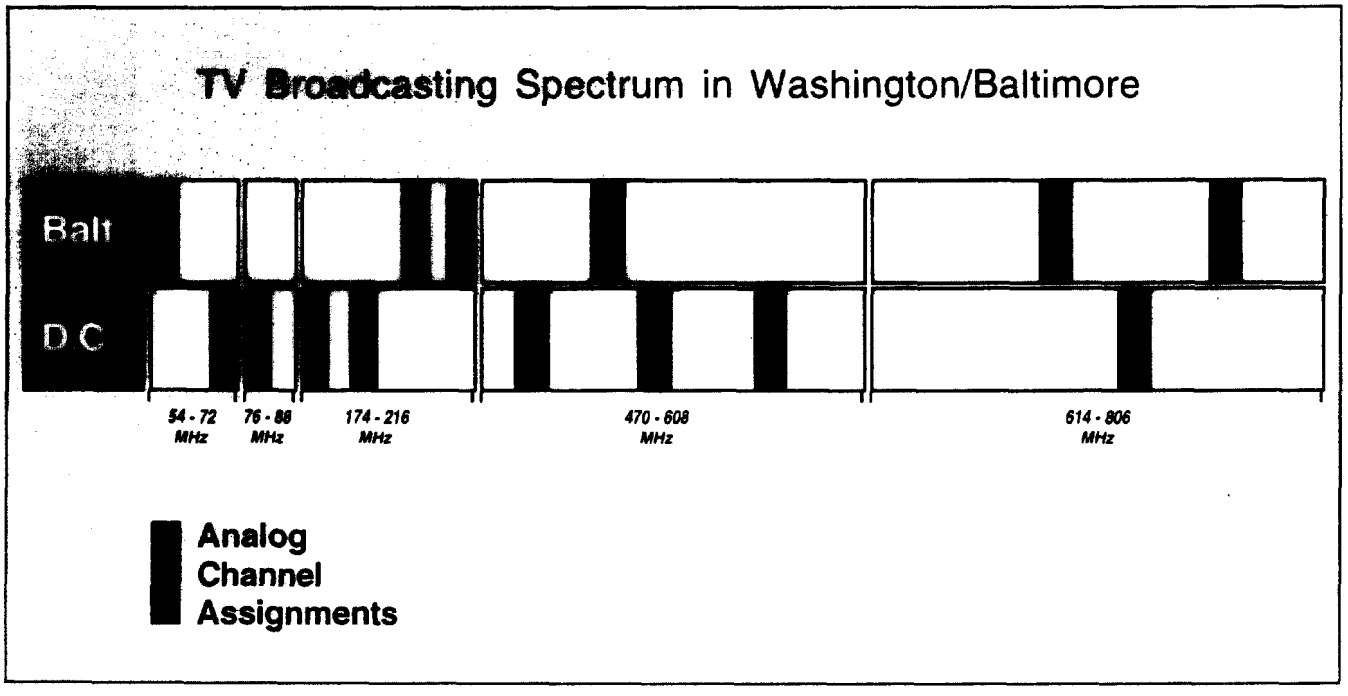
...SPECTRUM

- Because of the technical characteristics (propagation) of analog television broadcasting, channels using the same 6 MHz slice of spectrum in different geographic regions must also be separated to reduce interference (known as "co-channel interference").
- The following chart illustrates the other channel 4 assignments along the east coast.

VHF-TV
Channel 4 On East Coast

...SPECTRUM

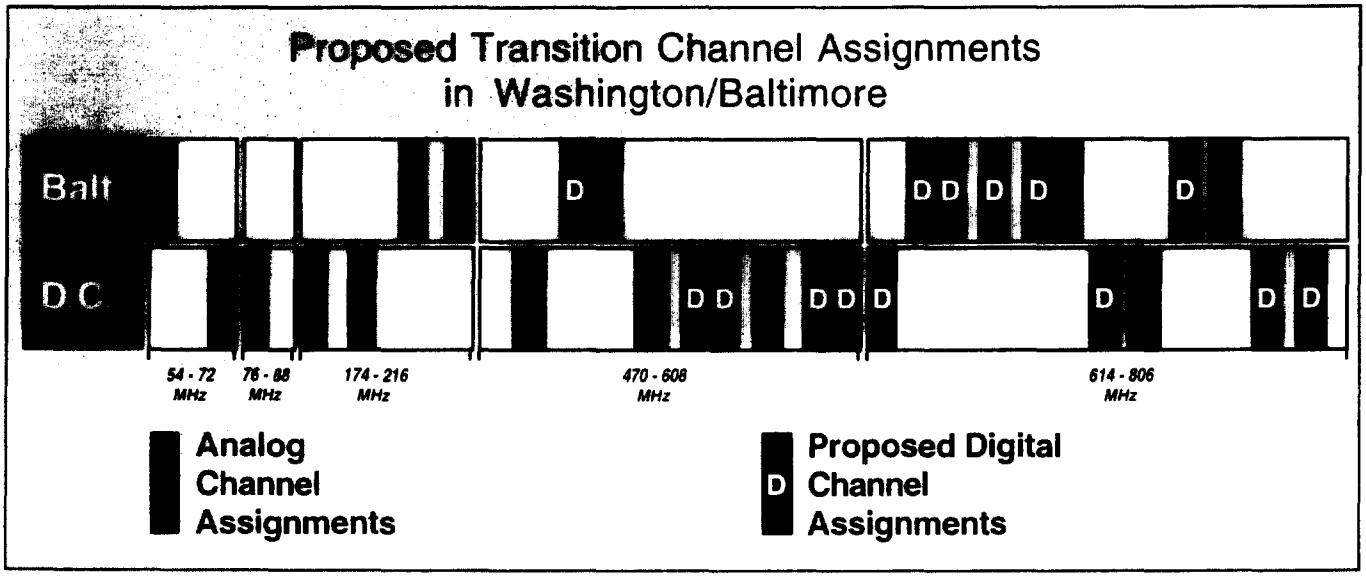
- If someone tried to broadcast on channel 4 in a nearby city (*e.g.*, Baltimore), it would create interference with Washington's channel 4. Thus, Baltimore's channel assignments are placed intermittently with Washington D.C.'s channels, as illustrated below.



...SPECTRUM

- To move from analog to digital broadcasting without consumers losing service will require broadcasters to simulcast their programming in both analog and digital format during a transition period. Because digital broadcasting does not require as much spacing to prevent interference, it can be placed on the buffer frequencies in between existing analog channels.

- For example, the following chart illustrates the anticipated channel assignments for Advanced Television Services (ATV) in the Baltimore/Washington area.

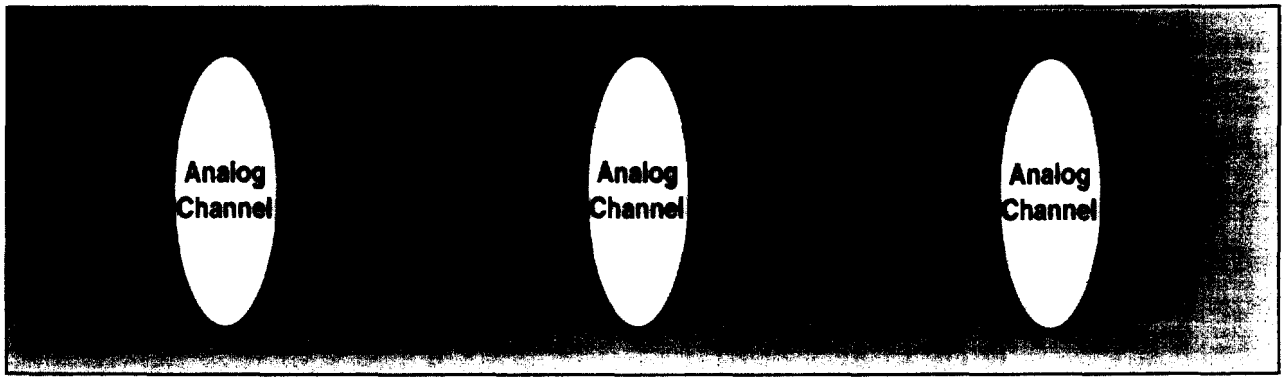


- Thus, the channels to be used for ATV service would still be located within that portion of the radio spectrum currently allocated to television broadcasting.

...SPECTRUM

- In considering the broadcasters' transition to digital service, policymakers should remember that the current value of the transition spectrum is minimal.
- To understand the limited value of the "transition spectrum," imagine that the chart below represents the television broadcast spectrum in a given market, with the beach balls representing that portion of the spectrum currently assigned to the existing analog channels and the surrounding area as the requisite "buffer zone" to protect those analog channels from interference.

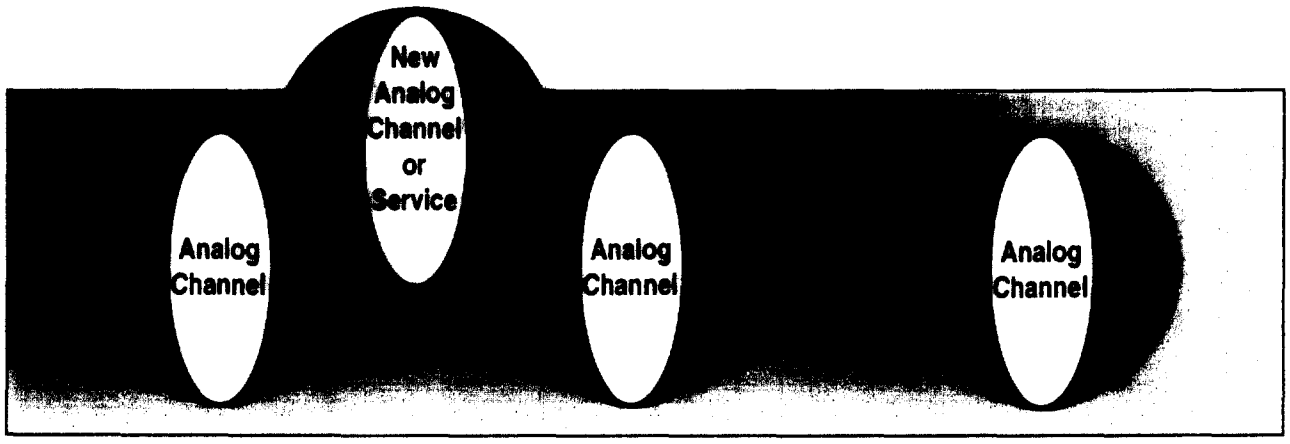
Television Broadcast Spectrum



...SPECTRUM

- Additional analog channels and other valuable communications services could not "fit" into the buffer zone without interfering with the analog broadcast channels. Only localized, low power devices in limited numbers — like garage door openers — could fit into that spectrum without causing interference.

New Analog Channels Would Interfere With Existing Channels

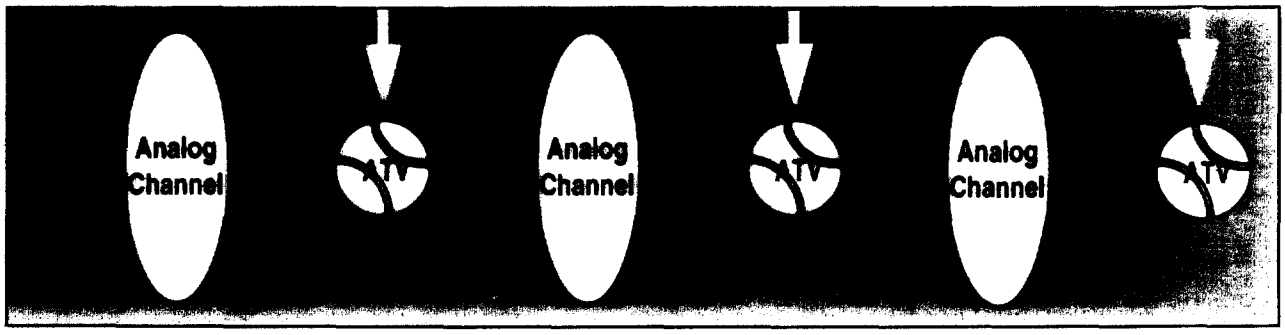


- If the spectrum were used for additional analog channels or other valuable services, consumers would not be able to receive a clear television picture free from interference.

...SPECTRUM

- In contrast, digital signals do not require as much of a "buffer zone" because:
  - digital signals can be lower power, thus interfering less with other signals; and
  - the digital format is more robust and resilient to interference.
- Because digital television signals are more "compact," they can be placed between existing analog stations, as illustrated below.

Advanced Television (ATV) Channels
Can Fit Between Existing Channels

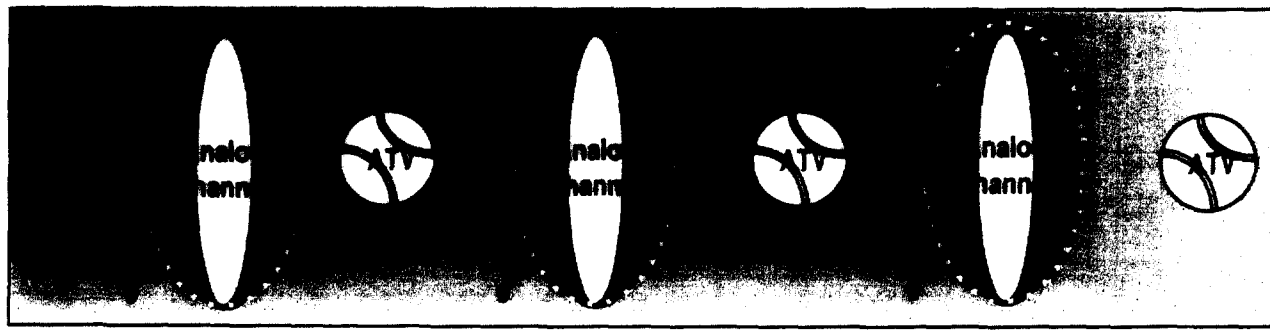


- Thus, the spectrum targeted for deployment of ATV service is of limited value. These buffer frequencies are unusable for analog and many other services because of potential adjacent and co-channel interference with existing analog assignments. ATV service, however, fits perfectly.

...SPECTRUM

- Broadcasters will need to simulcast analog and digital signals only temporarily. Once digital receivers (digital TVs) are readily available to consumers, broadcasters will return their current analog spectrum.

At End Of Transition, Broadcasters Return Analog Spectrum



- Thus, each broadcaster will start and end the transition to ATV with a single 6 MHz slice of the broadcast spectrum.

...SPECTRUM

- After the transition, the spectrum can be "re-packed." All of the digital channels, which require less spacing for protection from interference, can be pushed to one side of the broadcast spectrum.

Repack ATV Channels After Transition

...SPECTRUM

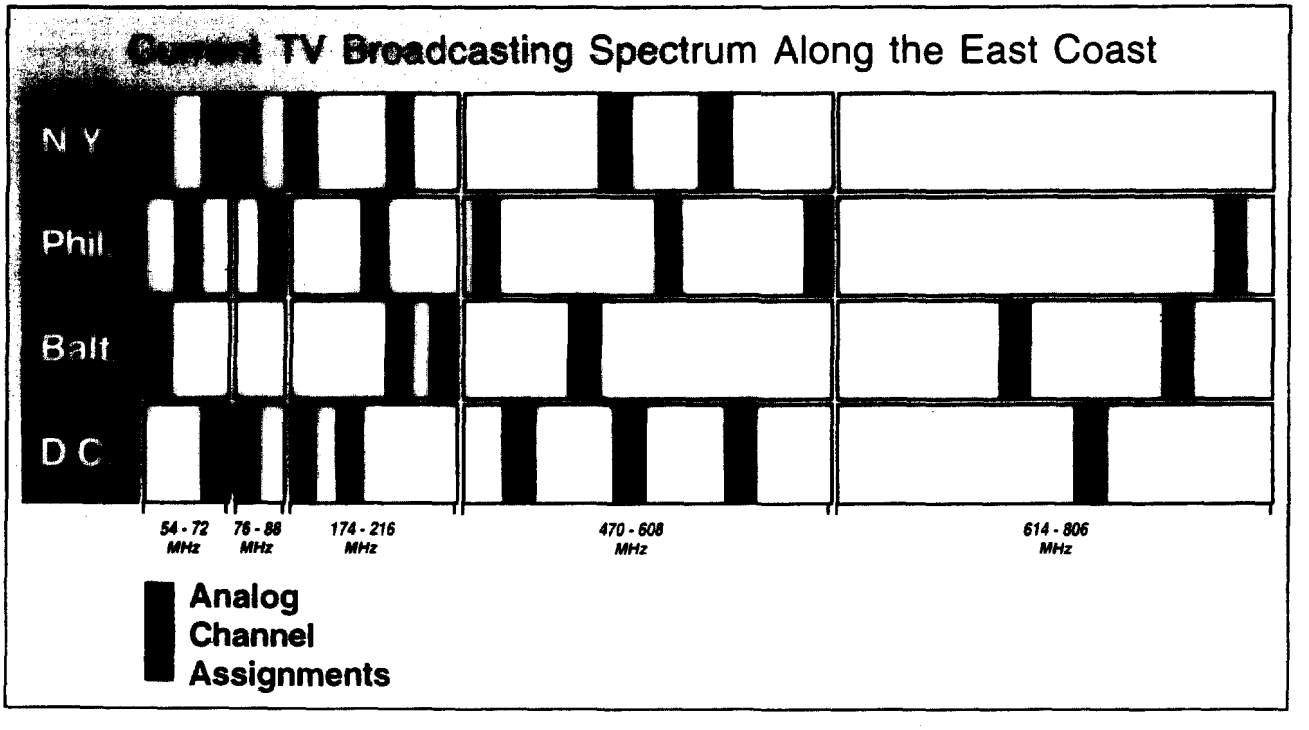
- After the spectrum has been "re-packed," blocks of clean, unused spectrum could be auctioned.

Virgin Spectrum Available For Auction After Repacking

- Such spectrum would be worth substantially more than the transition ATV channel assignment because:
  - It is *"virgin"* spectrum – as it is unused by any other service, there is no need to accommodate or relocate any other licenses;
  - It is more *flexible* spectrum – as it is contiguous, the spectrum could be sold in slices larger or smaller than 6 MHz making it able to accommodate a greater variety of services; and
  - It is *nationwide* spectrum – the same frequencies could be allocated across the entire country to permit regional or nationwide provision of service.

...SPECTRUM

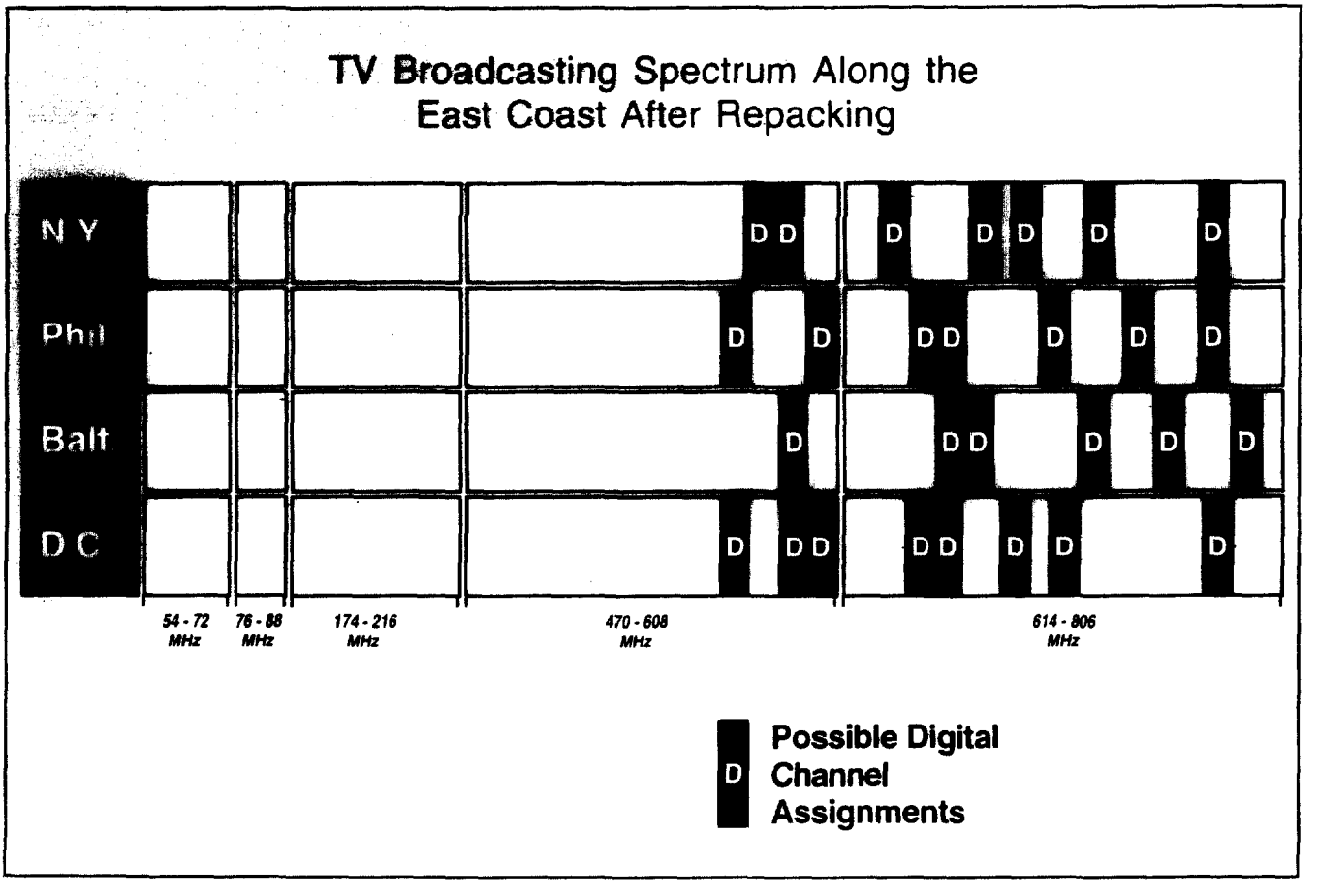
- Prior to repacking, any services trying to use the available spectrum would need to be digital and confined to small geographic regions to protect analog broadcasting from interference. Again examining the frequency allocation along the east coast, the following chart illustrates that, under the current analog scheme, the same frequency is generally not available outside of small localized areas.



- The FCC has concluded that mobile services are optimally provided in large regional areas. However, before repacking, a digital paging system using the available spectrum would be limited to the small geographic licensed area (e.g. Philadelphia). A customer of that system could not use their pager in another city (e.g. New York). Thus, the spectrum available prior to repacking would be of limited value.

...SPECTRUM

- After repacking, however, the available spectrum would be nationwide, as illustrated below.



- The same service could then be offered regionally or nationwide. For example, a new cellular phone service could be offered on the same frequency along the entire east coast. Such regional or nationwide spectrum would be worth substantially more at auction.

VALUING THE ATV SPECTRUM

- *In switching to ATV, broadcasters are not receiving any new spectrum.* Rather, they will simulcast their programming in digital format on one of the buffer frequencies that generally cannot be used for other types of services.

- *Broadcasters receive only a temporary transition channel.* Local broadcast stations only temporarily need two channels — one to broadcast to existing analog TV sets, and one to broadcast to new digital TV sets. After the transition the analog channel would be returned.

- *The channels to be used for ATV service cannot readily be used for non-television services.* The portions of the spectrum that the FCC plans to use for ATV service are non-contiguous, geographically scattered, and border on a service that requires large buffer zones to prevent interference.

- *Waiting until after the transition to auction the spectrum will raise even more money.* After the transition, the spectrum can be "repacked" and blocks of clean, flexible, nationwide spectrum can be auctioned at greater prices than either the current analog spectrum or the ATV spectrum.

- *If free over-the-air programming is to survive, Congress must give broadcasters the opportunity to compete on a level playing field.* To compete with the ever-increasing number of digital multi-channel providers, broadcasters must be afforded the opportunity to develop and rapidly implement advanced television.