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ATTACHMENT C

NOV - 8 1991

Federal Communications Commission
Office of the Secretary

HIGH DEFINITION TELEVISION

Member/PBS Transition Planning

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Introduction

1991
Each television station in America has a different station configuration and is in a unique competitive situation. Each station will have to examine its own situation in light of the many factors in order to decide what role it wants to play in the area of Advanced Television.

This document attempts to present some rudimentary and preliminary cost factors that will help stations to estimate the expense to add an ATV simulcast system. This is intended to be a shopping list with some basic groupings so that station general, financial, production and engineering managers can begin to develop long range strategies which would allow a manageable and graceful transition into ATV.

Much has been made in recent times about the high costs of advanced television. What has not been discussed is that these investments can be made over a many year period. Also not stated is that many of the high costs can be attributed to high research and development costs that must necessarily be absorbed through initial product sales. As time goes on, the technology of manufacturing and the equipment itself will improve and the costs will go down. Finally, costs generally refer to wide bandwidth major studio production equipment. As ATV develops, new more limited bandwidth equipment will need to be developed for local broadcast stations so that it can be produced at a lower cost. A few items of such equipment are already beginning to appear at HDTV trade shows. Others are now being discussed by equipment manufacturers and PBS is urging these manufacturers to complete the development of such products.

I. Tower Site/System

A. New Tower Site:

| | |
|-------------------------------------|----------|
| Land (50 acres) | \$500K |
| Site Development | \$100K |
| Access Road | \$900K |
| Soils and Survey | \$10K |
| Electric (substation and generator) | \$400K |
| Tower & Installation (1000') | \$500K |
| <hr/> | |
| Total | \$2,410K |

B. Existing Tower Site, New Tower:

| | |
|-------------------------------------|----------|
| Access road | \$150K |
| Soils and survey | \$10K |
| Electric (substation and generator) | \$400K |
| Tower & Installation (1000') | \$500K |
| <hr/> | |
| Total | \$1,060K |

C. Existing Tower Site, Existing Tower:

| | |
|---------------------|--------|
| Major modifications | \$100K |
|---------------------|--------|

D. Existing Tower Site, Existing Tower:

| | |
|---------------------|-------|
| Minor modifications | \$10K |
|---------------------|-------|

II. Transmitter Building

| | |
|--|---------------|
| A. New building(1500 sf) | \$113K |
| B. Existing building, addition(500 sf) | \$38K |
| C. Existing building, minor modifications | \$10K |

III. Legal Consultation

| | |
|---------------------------------------|---------------|
| A. No dedicated action | \$5K |
| B. Complaints, no court action | \$50K |
| C. Complaints, court action | \$500K |

IV. Engineering Services

| | |
|--|--------------|
| A. Antenna systems design | \$36K |
| B. FAA & FCC Application/Followup | \$50K |
| C. Tower Application/Followup | \$8K |

V. Transmission Plants

A. VHF Low Band Transmission Plant, 10KW ERP, with:

| | |
|---|---------------|
| Transmitter - 2 KW, Installed | \$150K |
| HDTV Encoder (or Format Converter/Modulator) | \$100K |
| Remote control system | \$30K |
| Antenna | \$250K |
| Transmission line (1000') | \$50K |
| Antenna/Line Installation Services | \$50K |
| Test Signal Inserter | \$26K |
| Test Equipment | \$65K |
| Precision Demodulator | \$22K |
| Demultiplexer | \$15K |
| HD Color Monitor 14" | \$11K |
| HD Precision Waveform Monitor | \$12K |
| HD Signal Monitor | \$20K |
| Audio Processing | \$6K |
| Audio Monitoring | \$10K |
| Total | \$817K |

B. VHF High Band Transmission Plant, 30 KW ERP, with:

| | |
|---|---------------|
| Transmitter - 5 KW | \$200K |
| HDTV Encoder (or Format Converter/Modulator) | \$100K |
| Remote Control System | \$30K |
| Antenna | \$250K |
| Transmission line (1000') | \$50K |
| Antenna/Line Installation Services | \$50K |
| Test Signal Inserter | \$26K |
| Test Equipment | \$65K |
| Precision Demodulator | \$22K |
| Demultiplexer | \$15K |
| HD Color Monitor 14" | \$11K |
| Precision WM | \$12K |
| HD Signal Monitor | \$20K |
| Audio Processing | \$6K |
| Audio Monitoring | \$10K |
| | <hr/> |
| Total | \$867K |

C. UHF Transmission Plant, 150 KW ERP, with:

| | |
|---|---------------|
| Transmitter - 20 KW | \$300K |
| HDTV Encoder (or Format Converter/Modulator) | \$100K |
| Remote Control System | \$30K |
| Antenna | \$250K |
| Transmission line (1000') | \$80K |
| Antenna/Line Installation Services | \$50K |
| Test Signal Inserter | \$26K |
| Test Equipment | \$65K |
| Precision Demodulator | \$22K |
| Demultiplexer | \$15K |
| HD Color Monitor 14" | \$11K |
| HD Precision Waveform Monitor | \$12K |
| HD Signal Monitor | \$20K |
| Audio Processing | \$6K |
| Audio Monitoring | \$10K |
| Total | \$997K |

Sample Transmission Package 1

10 KW ERP VHF, (Low Band) (best case)

Existing tower site

| | |
|---|---------------|
| Existing Tower, minor modification | \$10K |
| Existing building, minor modifications | \$10K |
| Legal fees, no complaints | \$5K |
| Engineering/antenna | \$36K |
| Engineering/FAA&FCC | \$50K |
| Engineering/tower | \$8K |
| Transmission Plant | \$817K |

Total **\$936K**

Sample Transmission Package 2

10 KW ERP VHF, (Low Band) (worst case)

| | |
|-----------------------------------|-----------------|
| New tower site & tower | \$2,410K |
| New building | \$113K |
| Legal fees | \$50K |
| Engineering/antenna system | \$36K |
| Engineering/FAA&FCC | \$50K |
| Engineering/tower | \$8K |
| Transmission Plant | \$817K |

Total **\$3,484K**

Sample Transmission Package 3

30 KW ERP VHF, (High Band) (best case)

Existing tower site

| | |
|---|---------------|
| Existing Tower, minor modification | \$10K |
| Existing building, minor modifications | \$10K |
| Legal fees, no complaints | \$5K |
| Engineering/antenna | \$36K |
| Engineering/FAA&FCC | \$50K |
| Engineering/tower | \$8K |
| Transmission Plant | \$867K |

Total **\$986K**

Sample Transmission Package 4

30 KW ERP VHF, (High Band) (worst case)

| | |
|-----------------------------------|-----------------|
| New tower site & tower | \$2,410K |
| New building | \$113K |
| Legal fees | \$50K |
| Engineering/antenna system | \$36K |
| Engineering/FAA&FCC | \$50K |
| Engineering/tower | \$8K |
| Transmission Plant | \$867K |

Total **\$3,534K**

Sample Transmission Package 5**150 KW ERP UHF (best case)****Existing tower site**

| | |
|--|-----------------|
| Existing tower, minor modification | \$10K |
| Existing building, minor modification | \$10K |
| Legal fees, no complaints | \$5K |
| Engineering/antenna system | \$36K |
| Engineering/FAA & FCC | \$50K |
| Engineering/tower | \$8K |
| Transmission Plant | \$997K |
| Total | \$1,116K |

Sample Transmission Package 6**150 KW ERP UHF (worst case)**

| | |
|-----------------------------------|-----------------|
| New tower site & tower | \$2,410K |
| New building | \$113K |
| Legal fees | \$50K |
| Engineering/antenna system | \$36K |
| Engineering/FAA&FCC | \$50K |
| Engineering/tower | \$8K |
| Transmission Plant | \$997K |
| Total | \$3,664K |

VI. Broadcast Origination/Studio Plant

MODEL #1 HDTV - PASS-THROUGH NETWORK PROGRAMMING

HDTV Broadcast Operations

| | | | |
|----|--------------------------------------|------------|-------|
| 1 | Broadcast/routing switcher | \$80K/each | \$80K |
| 4 | HD color monitors 4 - 18" | \$11K/each | \$44K |
| | Video signal processing/distribution | | \$35K |
| 1 | Upconverter | \$50K/each | \$50K |
| 1 | Downconverter | \$50K/each | \$50K |
| 2 | HD Precision WM | \$12K/each | \$24K |
| 2 | HD Precision Signal Monitors | \$20K/each | \$40K |
| 12 | HD B&W monitors (8") | \$2K/each | \$24K |
| | Audio monitoring (4 ch.) | \$10K/each | \$10K |
| | HD Studio Test Equipment | | \$75K |
| | WB Oscilloscope | \$15K | |
| | HD Test Generator | \$26K | |
| | Bit Error Rate Analyzer | \$12K | |
| | Tools | \$15K | |
| | Misc | \$7K | |
| 1 | Precision Demodulators | \$22K/each | \$22K |
| 1 | Demultiplexers | \$15K/each | \$15K |

MODEL #1 HDTV - continued

HDTV PBS Feeds

| | | | |
|---|--------------------------------------|------------|-------|
| 1 | HD satellite receiver | \$10K/each | \$10K |
| 1 | HD character generator | \$60K/each | \$60K |
| 1 | HD still store | \$70K/each | \$70K |
| 1 | HD sync generator/pulse distribution | \$25K/lot | \$25K |
| 1 | HD Frame Synchronizer | \$38K/each | \$38K |

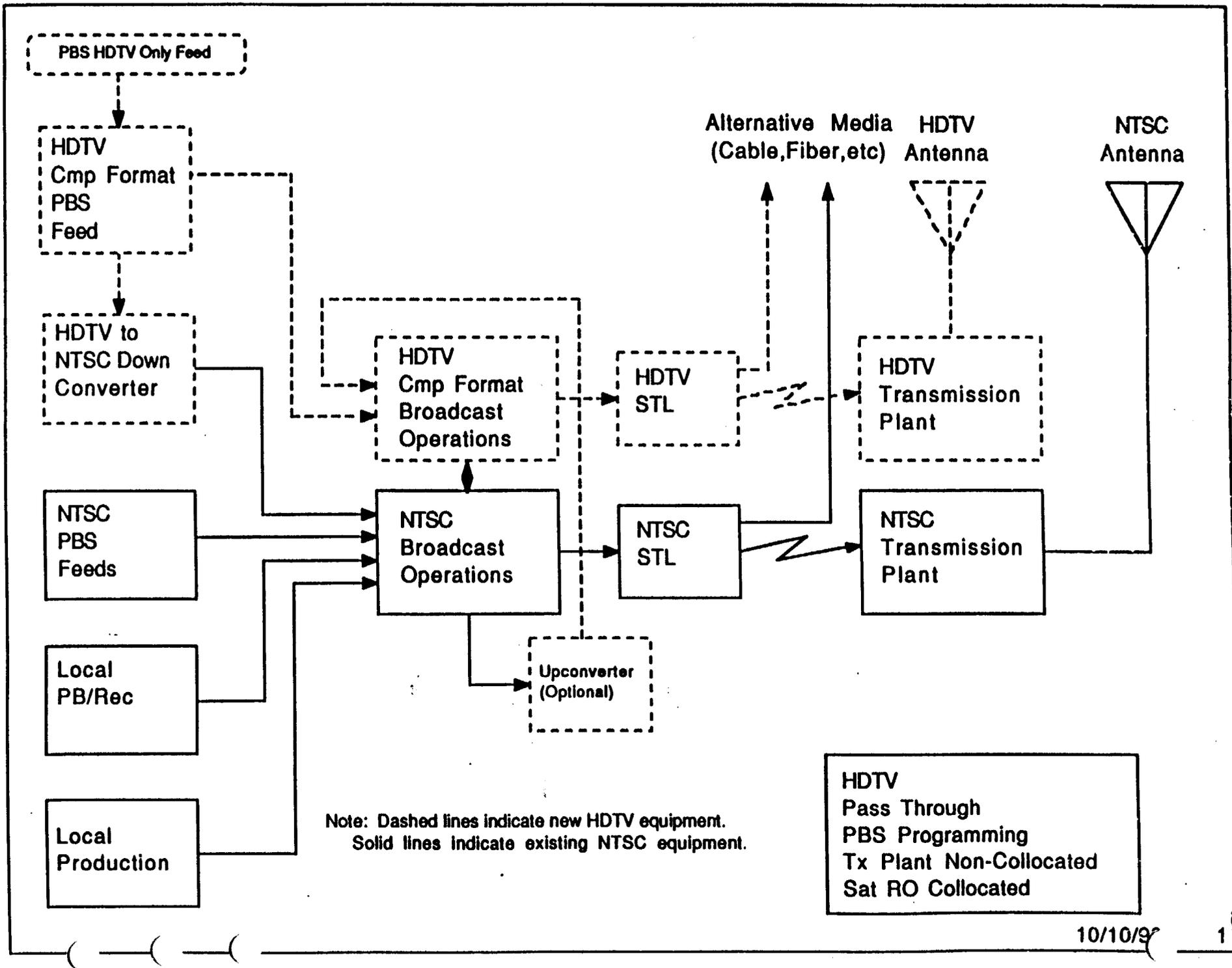
HDTV Studio to Transmitter Links

| | | | |
|---|--------|------------|-------|
| 1 | HD STL | \$48K/each | \$48K |
|---|--------|------------|-------|

Subtotal **\$720K**

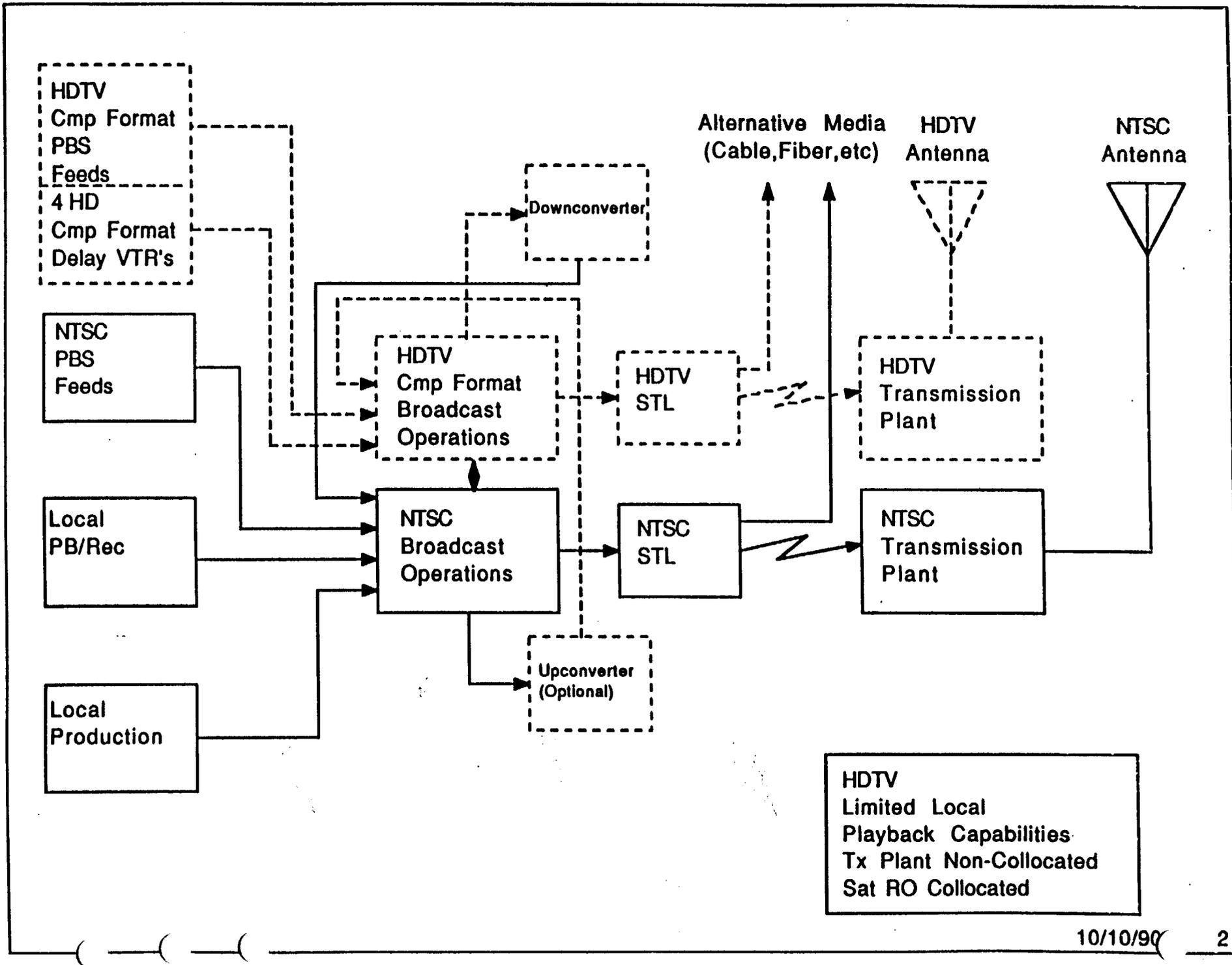
Installation Materials (7%) **\$50K**

Total for Model 1 **\$770K**



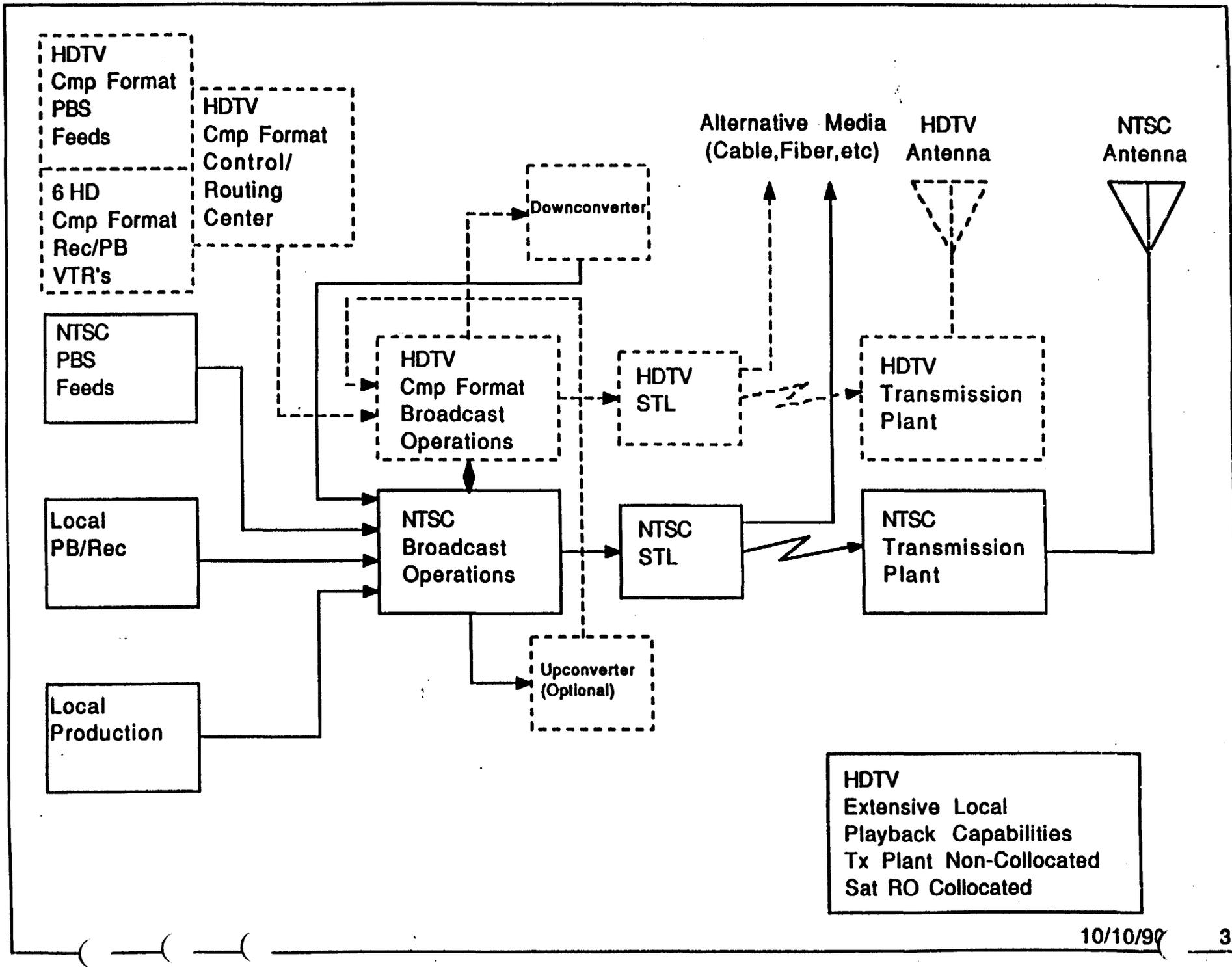
MODEL #2 HDTV - LIMITED LOCAL PLAYBACK CAPABILITIES

| | | | |
|---|-------------------------------|------------|----------|
| 4 | HD compressed format VTR's | \$80K/each | \$320K |
| | Router Expansion for HD VTR's | | \$80K |
| 8 | HD B&W Monitors (8") | \$2K/each | \$16K |
| 2 | HD 14" color monitors | \$11K/each | \$22K |
| 2 | HD Utility WM | \$6K/each | \$12K |
| 1 | HD Precision WM | \$12K/each | \$12K |
| 1 | HD Precision Signal Monitor | \$20K/each | \$20K |
| | | | <hr/> |
| | Subtotal | | \$482K |
| | Installation Materials (5%) | | \$24K |
| | | | <hr/> |
| | Model 2 Total | | \$506K |
| | | | <hr/> |
| | Total for Models 1 & 2 | | \$1,276K |



MODEL #3 HDTV - EXTENSIVE LOCAL PLAYBACK CAPABILITIES

| | | | |
|---|---|------------|----------|
| 2 | HD compressed format VTR's | \$80K/each | \$160K |
| 1 | HD compressed format video cart machine | \$800/each | \$800K |
| | HD router expansion | | \$40K |
| 8 | HD B&W monitors (8") | \$2K/each | \$16K |
| | | | <hr/> |
| | Subtotal | | \$1,016K |
| | Installation Materials (5%) | | \$51K |
| | | | <hr/> |
| | Model 3 Total | | \$1,067K |
| | | | <hr/> |
| | Total for Models 1, 2 and 3 | | \$2,343K |



MODEL #4 HDTV - PRODUCTION/POST/REMOTE CAPABILITIES

Broadcast Format Equipment (Compressed Format)

| | | | |
|---|----------------------------|------------|--------|
| 2 | HD compressed format VTR's | \$80K/each | \$160K |
| | HD router expansion | | \$40K |
| 4 | HD B&W Monitors (8" Dual) | \$2K/each | \$8K |
| 1 | HD STL (Add Redundancy) | \$48K/each | \$48K |
| | | | <hr/> |
| | Distribution Subtotal | | \$256K |

MODEL #4 HDTV - continued

Production Format Equipment (Wideband Format)
(all of the following operates in a full bandwidth format)

Studio Production Equipment

| | | | |
|---|--|-------------|---------|
| 3 | HD VTR's | \$320K/each | \$960K |
| 1 | HD routing switcher | \$160K/each | \$160K |
| 3 | HD cameras | \$375K/each | \$1125K |
| 1 | HD switcher | \$400K/each | \$400K |
| | HD signal distribution/processing | | \$35K |
| 1 | HD DVE | \$250K/each | \$250K |
| | HD signal distribution | | \$75K |
| 1 | HD compressed/Full Band Format Converter | \$50K/each | \$50K |
| 1 | HD character generator | \$120K/each | \$120K |
| | HD sync system/distribution | | \$75K |

MODEL #4 HDTV - continued

| | | | |
|----|-----------------------------|-------------|--------|
| 2 | HD Color Monitors (28") | \$25K/each | \$50K |
| 4 | HD Color Monitors (18") | \$11K/each | \$44K |
| 13 | HD B&W Monitors (14") | \$3.7K/each | \$48K |
| 8 | HD B&W Monitors (8") | \$2K/each | \$16K |
| 8 | HD Utility WM's | \$6K/each | \$48K |
| 1 | HD Frame Synchronizer | \$38K/each | \$38K |
| | HD Test Equipment | | \$100K |
| 1 | HD Precision WM | \$12K/each | \$12K |
| 1 | HD Precision Signal Monitor | \$20K/each | \$20K |

Field Production

| | | | |
|---|-----------------|-------------|--------|
| 1 | HD field camera | \$375K/each | \$375K |
| 1 | HD field VTR | \$320K/each | \$320K |

MODEL #4 HDTV - continued**Post Production**

| | | | |
|---|---------------------------------------|-------------|--------|
| 1 | HD editing system | \$50K/each | \$50K |
| 1 | HD editing switcher/signal processing | | \$350K |
| 1 | HD DVE | \$250K/each | \$250K |
| 1 | HD paint system | \$500K/each | \$500K |
| 1 | HD character generator | \$120K/each | \$120K |
| 4 | HD color monitors (18") | \$11K/each | \$44K |
| 8 | HD B&W monitors | \$2K/each | \$16K |
| 2 | HD utility WM | \$6K/each | \$12K |
| 1 | HD Signal Monitor | \$20K/each | \$20K |

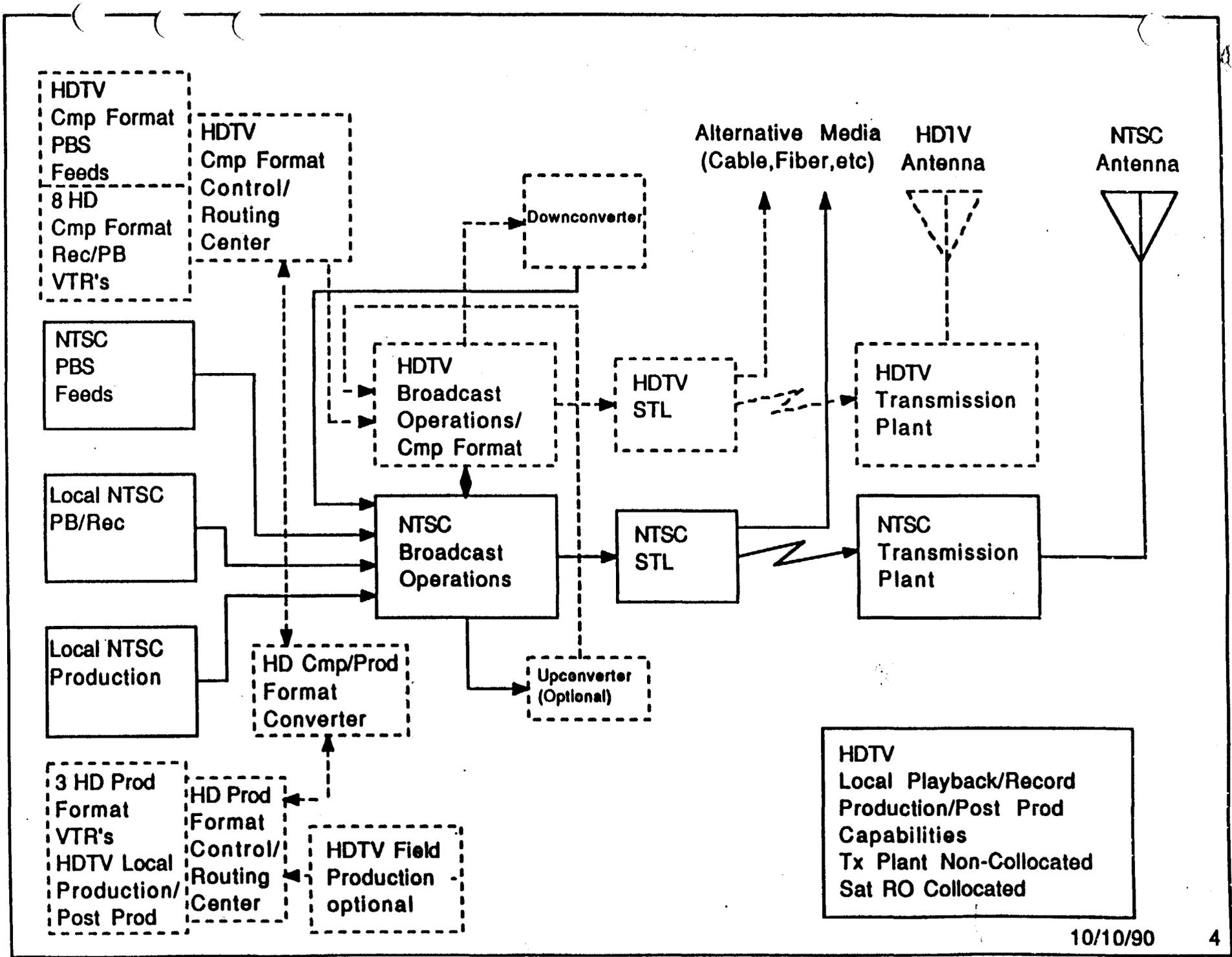
Production Subtotal \$5,683K

Installation Materials/Spares (5%) 284K

Production Total \$5,967K

Model 4 Total \$6,223K

Total for Models 1, 2, 3, & 4 \$8,566K



MODEL #5 HDTV - FULL CONVERSION

| | | | |
|----------|---|--------------------|-----------------|
| 4 | HD wideband VTR's | \$320K/each | \$1,280K |
| 8 | HD B&W monitors (8") | \$2K/each | \$16K |
| | | | <hr/> |
| | Subtotal | | \$1,296K |
| | Installation Materials (5%) | | \$65K |
| | | | <hr/> |
| | Model 5 Total | | \$1,361K |
| | Total for Models 1, 2, 3, 4, & 5 | | \$9,776K |

