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(54) **REMOTE CONTROL FOR MENU DRIVEN SUBSCRIBER ACCESS TO TELEVISION PROGRAMMING**

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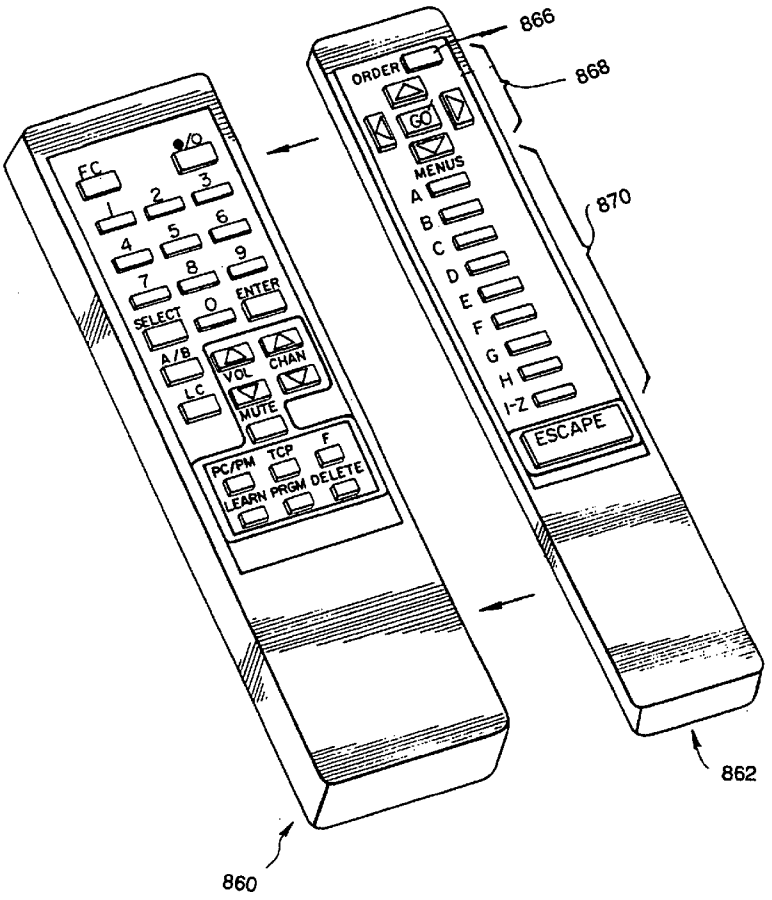
Publication Classification

(51) **Int. Cl.**[7] **H04N 7/173**; H04N 7/16; G06F 13/00; H04N 5/445; G06F 3/00; H04N 5/44

(52) **U.S. Cl.** **348/734**; 725/38; 725/135

(57) **ABSTRACT**

An expanded television program delivery system is disclosed which allows viewers to select television and audio program choices from a series of menus. Menus are partially stored in a set-top terminal in each subscriber's home. The menus may be reprogrammed by signals sent from a head-end or from a central operations center. The system allows for a great number of television signals to be transmitted by using digital compression techniques. An operations center with computer-assisted packaging allows various television, audio and data signals to be combined, compressed and multiplexed into signals transmitted on various channels to a cable headend which distributes the signals to individual set-top terminals. Various types of menus may be used and the menus may incorporate information included within the video/data signal received by the set-top terminal. A remote control unit with icon buttons allows a subscriber to select programs based upon a series of major menus, submenus, and during program menus. Various billing and statistics gathering methods for the program delivery system are also disclosed.



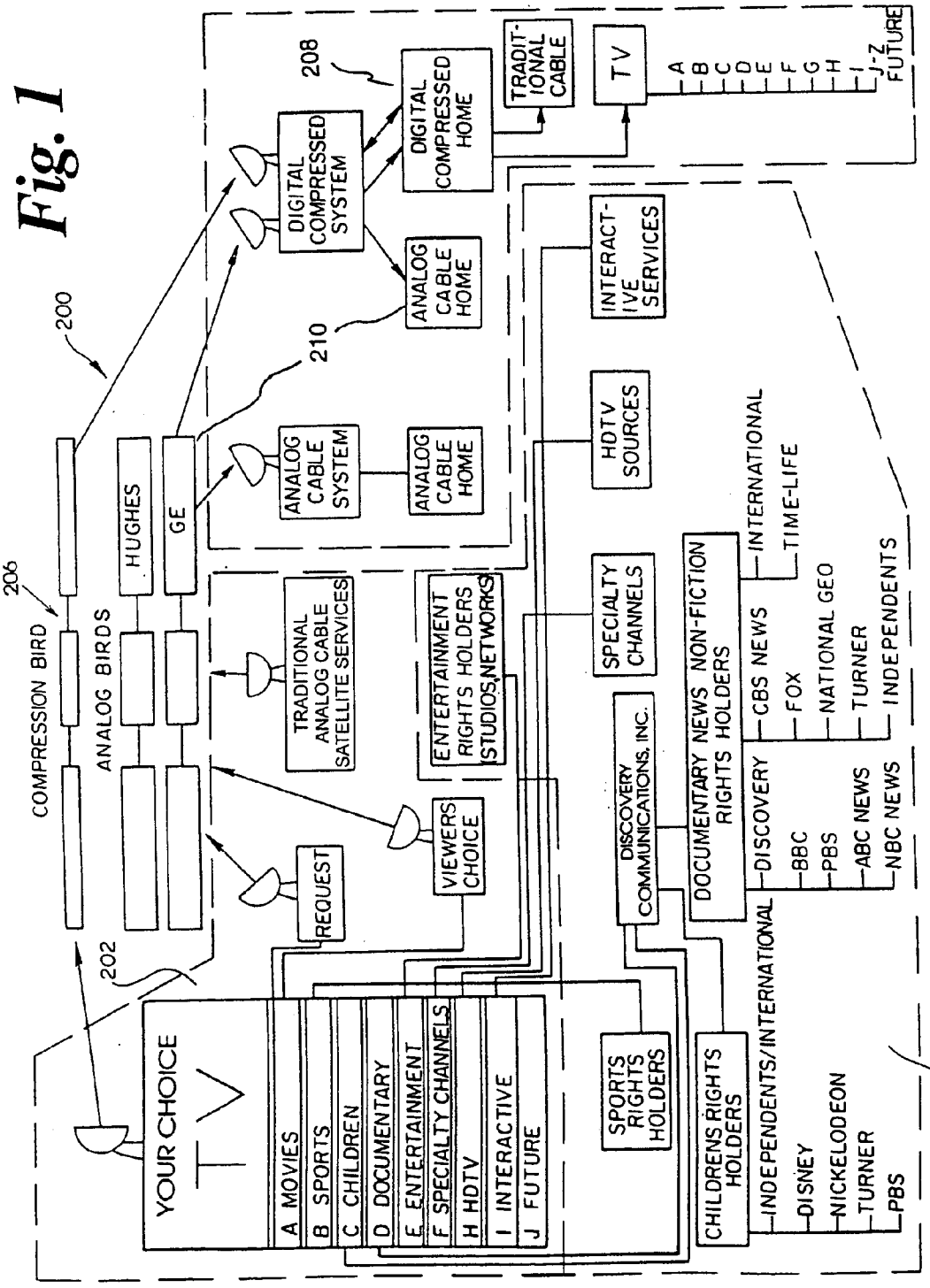


Fig. 1
200
206
COMPRESSION BIRD
ANALOG BIRDS
202
HUGHES
GE
REQUEST
VIEWERS CHOICE
TRADITIONAL ANALOG CABLE SATELLITE SERVICES
ENTERTAINMENT RIGHTS HOLDERS STUDIOS, NETWORKS
DISCOVERY COMMUNICATIONS, INC.
SPORTS RIGHTS HOLDERS
CHILDRENS RIGHTS HOLDERS
DOCUMENTARY NEWS NON-FICTION RIGHTS HOLDERS
INDEPENDENTS/INTERNATIONAL
DISNEY
NICKELODEON
TURNER
PBS
DISCOVERY
BBC
PBS
ABC NEWS
NBC NEWS
CBS NEWS
FOX
NATIONAL GEO
TURNER
INDEPENDENTS
INTERNATIONAL
TIME-LIFE
YOUR CHOICE TV
A MOVIES
B SPORTS
C CHILDREN
D DOCUMENTARY
E ENTERTAINMENT
F SPECIALTY CHANNELS
H HDTV
I INTERACTIVE
J FUTURE
204
ANALOG CABLE SYSTEM
ANALOG CABLE HOME
210
DIGITAL COMPRESSED SYSTEM
208
ANALOG CABLE HOME
DIGITAL COMPRESSED HOME
TRADIT-IONAL CABLE
TV
A
B
C
D
E
F
G
H
I
J-Z FUTURE
INTERACT-IVE SERVICES
HDTV SOURCES
SPECIALTY CHANNELS

Fig. 2

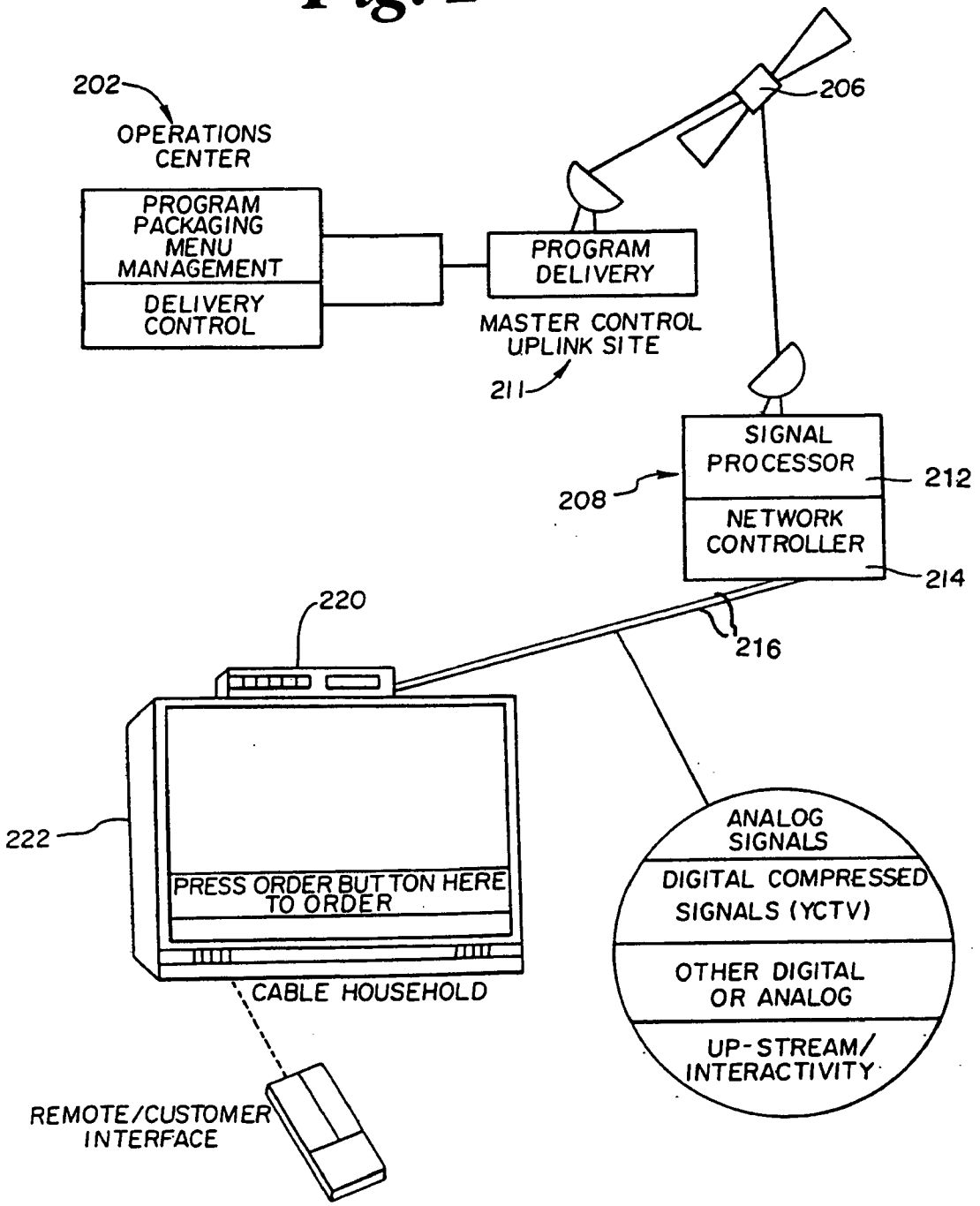

202
OPERATIONS CENTER
PROGRAM PACKAGING MENU MANAGEMENT
DELIVERY CONTROL
PROGRAM DELIVERY
MASTER CONTROL UPLINK SITE
211
206
SIGNAL PROCESSOR
212
208
NETWORK CONTROLLER
214
216
220
222
PRESS ORDER BUTTON HERE TO ORDER
CABLE HOUSEHOLD
REMOTE/CUSTOMER INTERFACE
ANALOG SIGNALS
DIGITAL COMPRESSED SIGNALS (YCTV)
OTHER DIGITAL OR ANALOG
UP-STREAM/ INTERACTIVITY

Fig. 3a

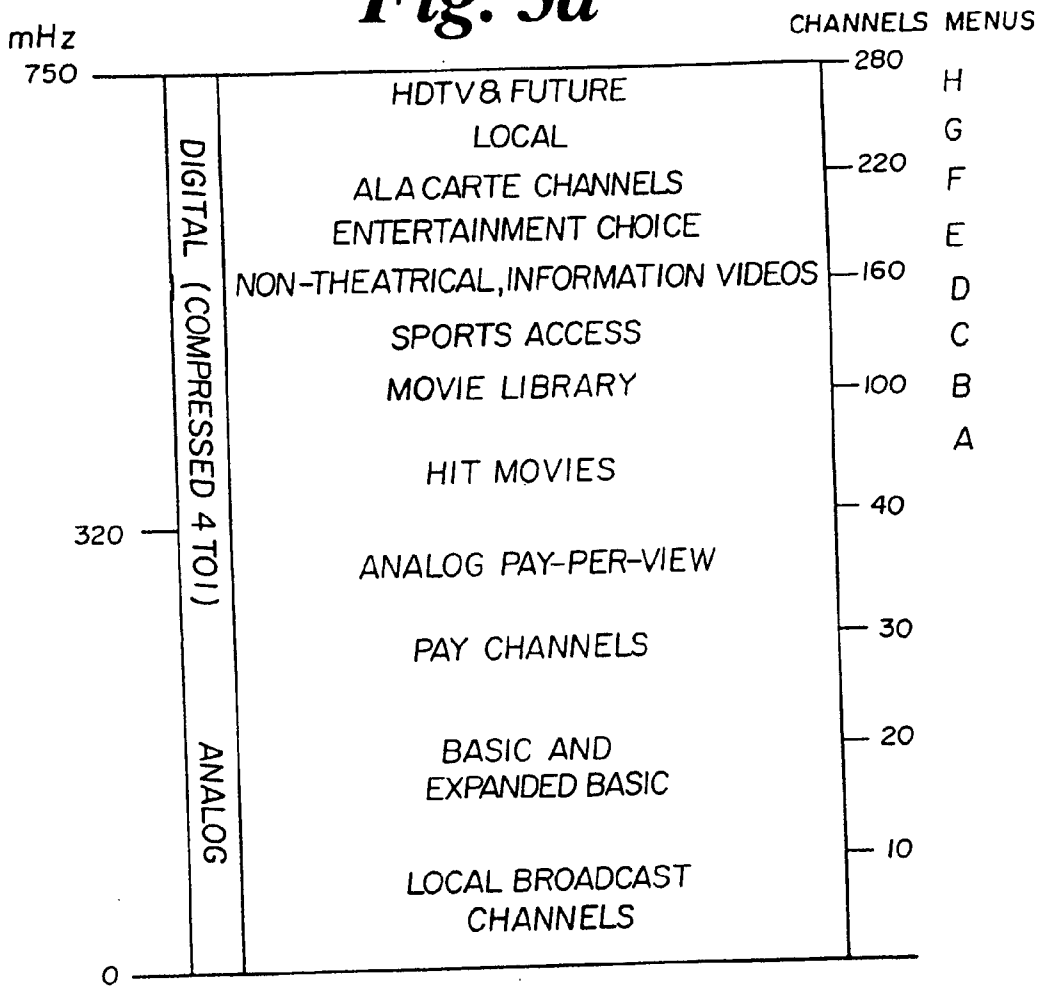


Fig. 3b

230

CHANNEL MENU	PROGRAMMING CATEGORY	# CHANNELS ALLOCATED
A	MOVIES	50
B	SPORTS	2
C	CHILDRENS	3
D	DOCUMENTARY	14
E	ENTERTAINMENT	10
F	SPECIALTY CHANNELS	15
G	LOCAL	N/A
H	HDTV	4
I	INTERACTIVE	2
	COMBINED	100

Fig. 3c

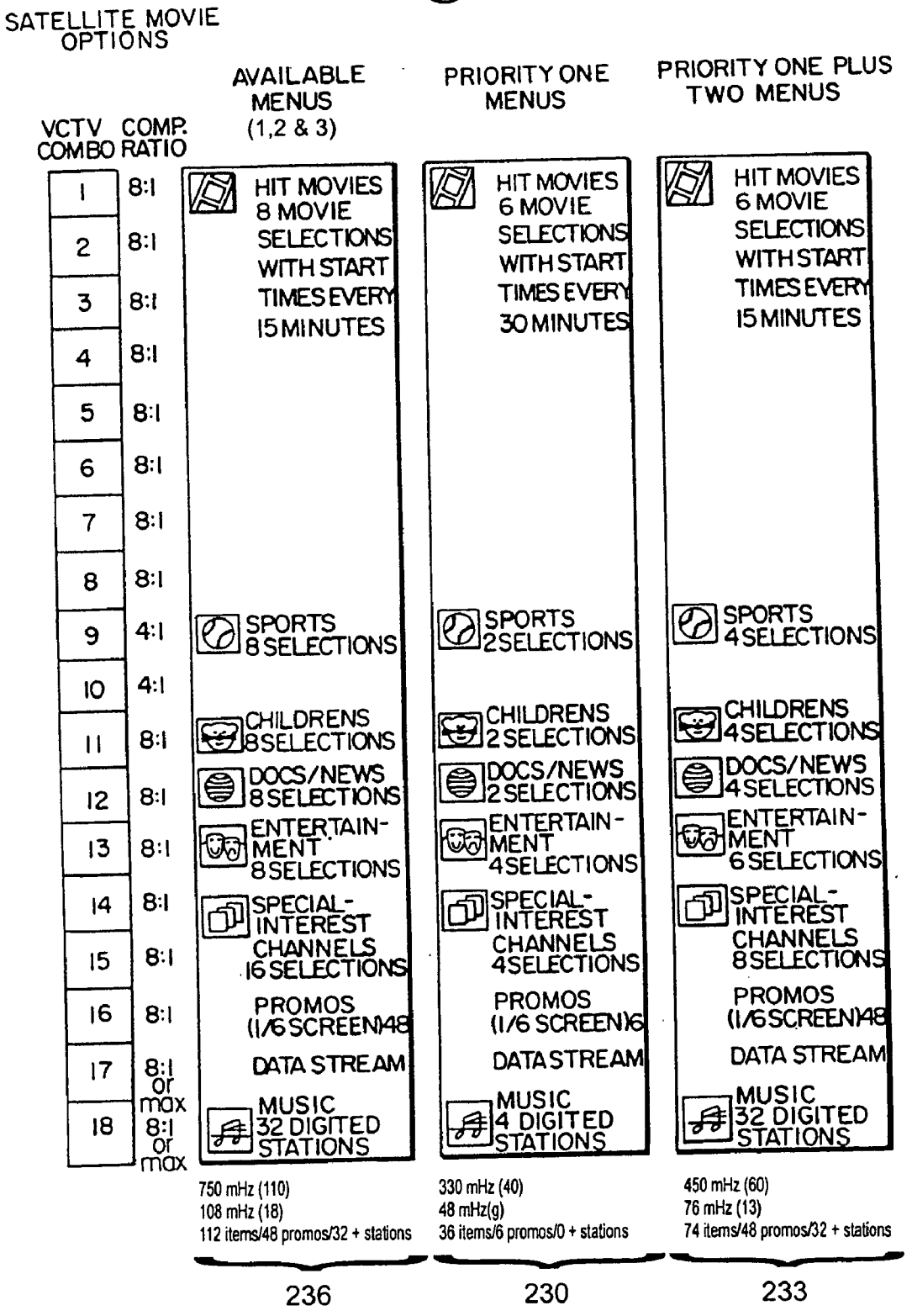
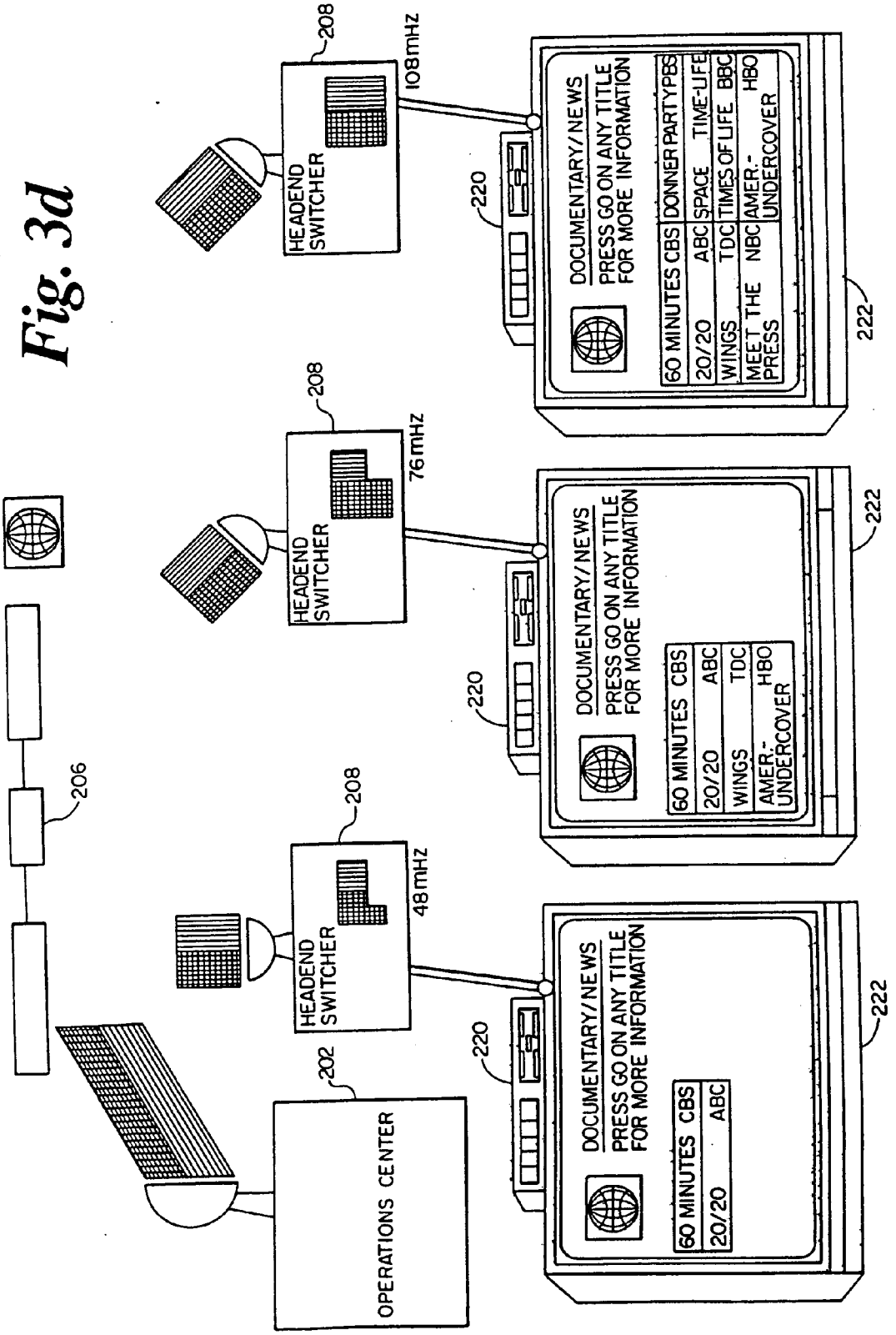

SATELLITE MOVIE OPTIONS
VCTV COMBO
COMP. RATIO
AVAILABLE MENUS (1,2 & 3)
PRIORITY ONE MENUS
PRIORITY ONE PLUS TWO MENUS
1 8:1
2 8:1
3 8:1
4 8:1
5 8:1
6 8:1
7 8:1
8 8:1
9 4:1
10 4:1
11 8:1
12 8:1
13 8:1
14 8:1
15 8:1
16 8:1
17 8:1 or max
18 8:1 or max
HIT MOVIES 8 MOVIE SELECTIONS WITH START TIMES EVERY 15 MINUTES
SPORTS 8 SELECTIONS
CHILDRENS 8 SELECTIONS
DOCS/NEWS 8 SELECTIONS
ENTERTAIN-MENT 8 SELECTIONS
SPECIAL-INTEREST CHANNELS 16 SELECTIONS
PROMOS (1/6 SCREEN)48
DATA STREAM
MUSIC 32 DIGITED STATIONS
HIT MOVIES 6 MOVIE SELECTIONS WITH START TIMES EVERY 30 MINUTES
SPORTS 2 SELECTIONS
CHILDRENS 2 SELECTIONS
DOCS/NEWS 2 SELECTIONS
ENTERTAIN-MENT 4 SELECTIONS
SPECIAL-INTEREST CHANNELS 4 SELECTIONS
PROMOS (1/6 SCREEN)6
DATA STREAM
MUSIC 4 DIGITED STATIONS
HIT MOVIES 6 MOVIE SELECTIONS WITH START TIMES EVERY 15 MINUTES
SPORTS 4 SELECTIONS
CHILDRENS 4 SELECTIONS
DOCS/NEWS 4 SELECTIONS
ENTERTAIN-MENT 6 SELECTIONS
SPECIAL-INTEREST CHANNELS 8 SELECTIONS
PROMOS (1/6 SCREEN)48
DATA STREAM
MUSIC 32 DIGITED STATIONS
750 mHz (110)
108 mHz (18)
112 items/48 promos/32 + stations
330 mHz (40)
48 mHz(g)
36 items/6 promos/0 + stations
450 mHz (60)
76 mHz (13)
74 items/48 promos/32 + stations
236
230
233

Fig. 3d


OPERATIONS CENTER
202
206
HEADEND SWITCHER
208
48 mHz
76 mHz
108 mHz
220
222
DOCUMENTARY/NEWS
PRESS GO ON ANY TITLE FOR MORE INFORMATION
60 MINUTES CBS
20/20 ABC
WINGS TDC
AMER.- UNDERCOVER HBO
DONNER PARTY PBS
SPACE TIME-LIFE
TIMES OF LIFE BBC
MEET THE PRESS NBC
AMER.- UNDERCOVER HBO

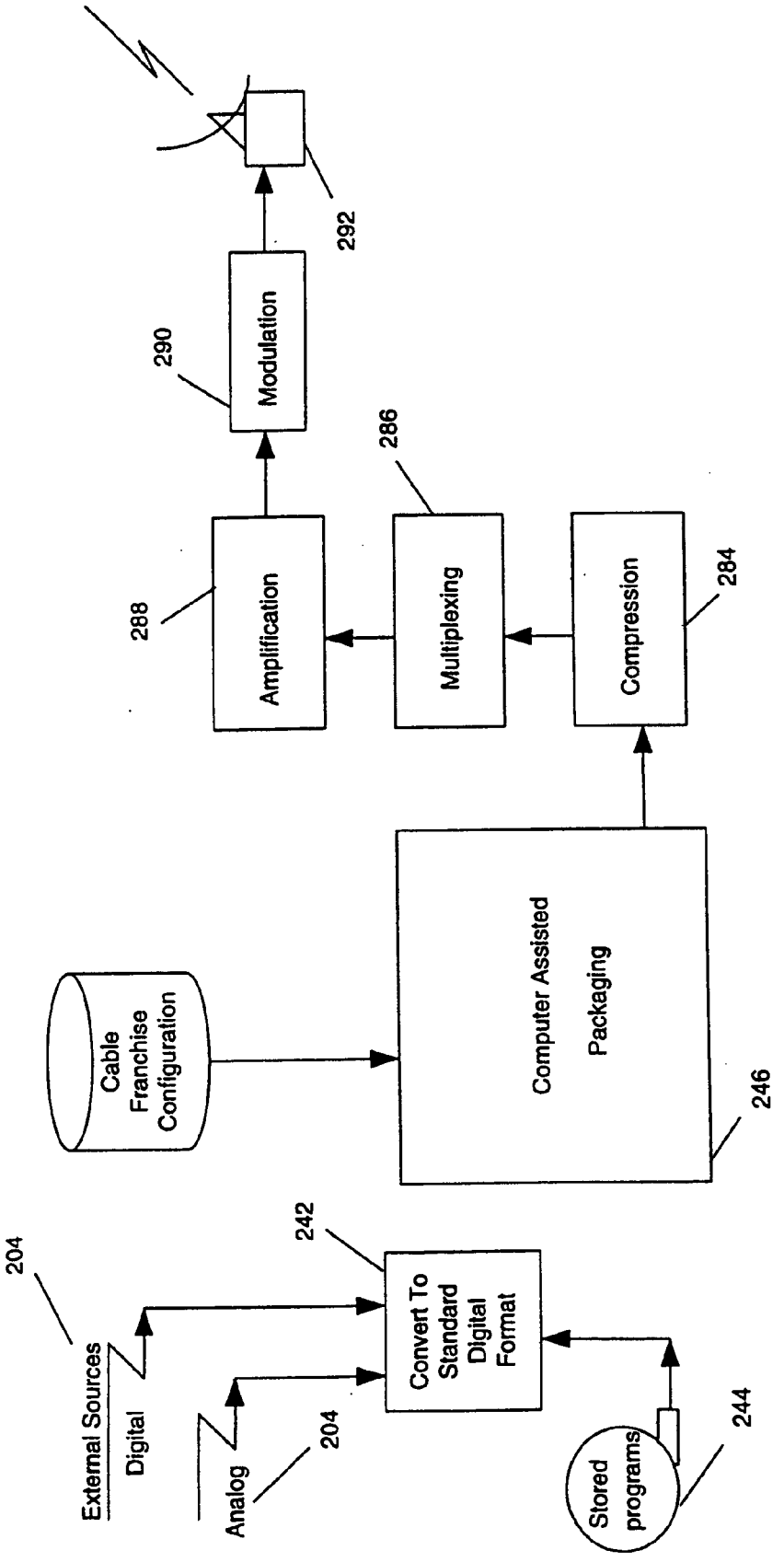

External Sources
Digital
Analog
204
204
242
Convert To Standard Digital Format
Stored programs
244
Cable Franchise Configuration
Computer Assisted Packaging
246
Compression
284
Multiplexing
286
Amplification
288
Modulation
290
292

Fig. 4a

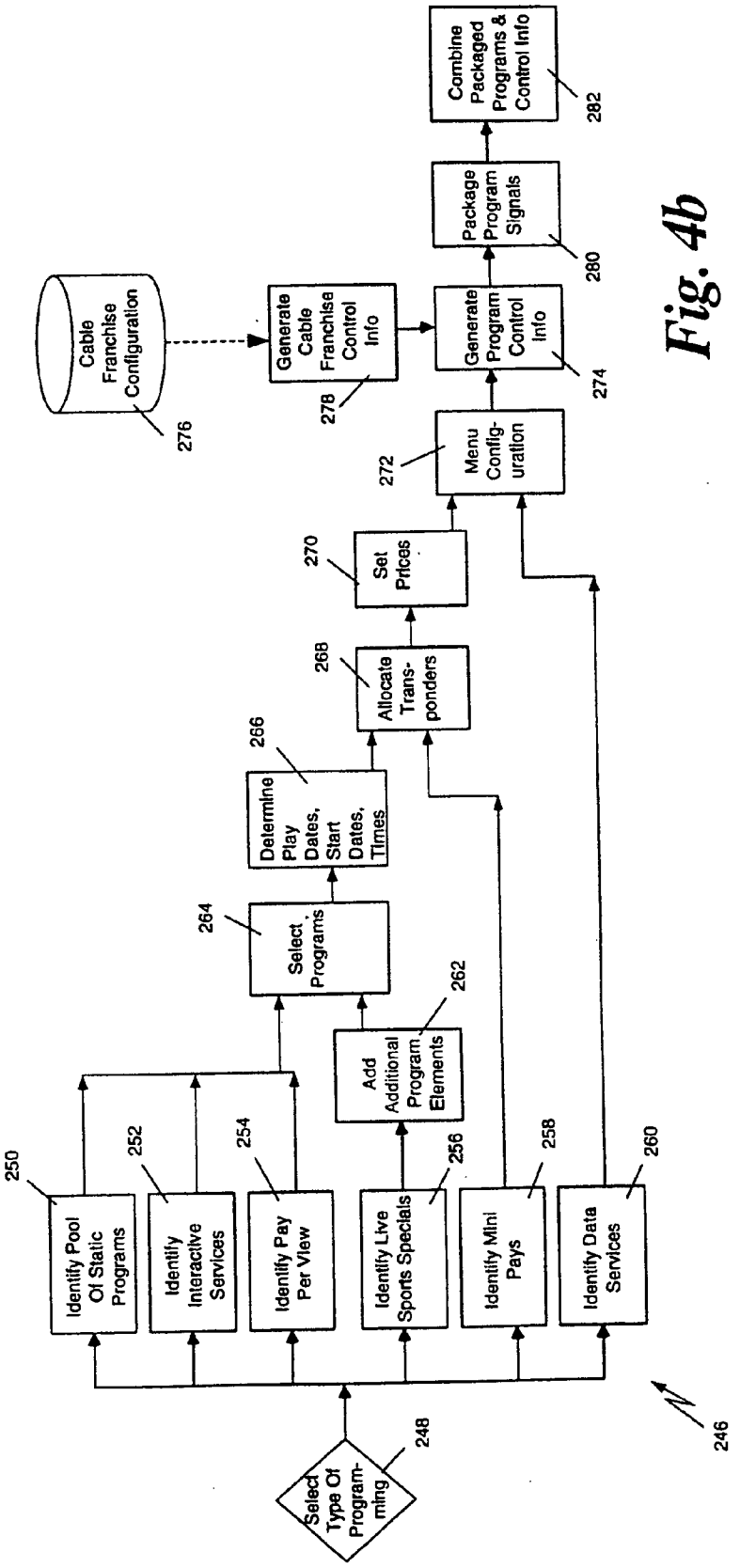

Select Type Of Programming
248
Identify Pool Of Static Programs
250
Identify Interactive Services
252
Identify Pay Per View
254
Identify Live Sports Specials
256
Identify Mini Pays
258
Identify Data Services
260
246
Add Additional Program Elements
262
Select Programs
264
Determine Play Dates, Start Dates, Times
266
Allocate Transponders
268
Set Prices
270
Menu Configuration
272
Generate Program Control Info
274
Cable Franchise Configuration
276
Generate Cable Franchise Control Info
278
Package Program Signals
280
Combine Packaged Programs & Control Info
282

Fig. 4b

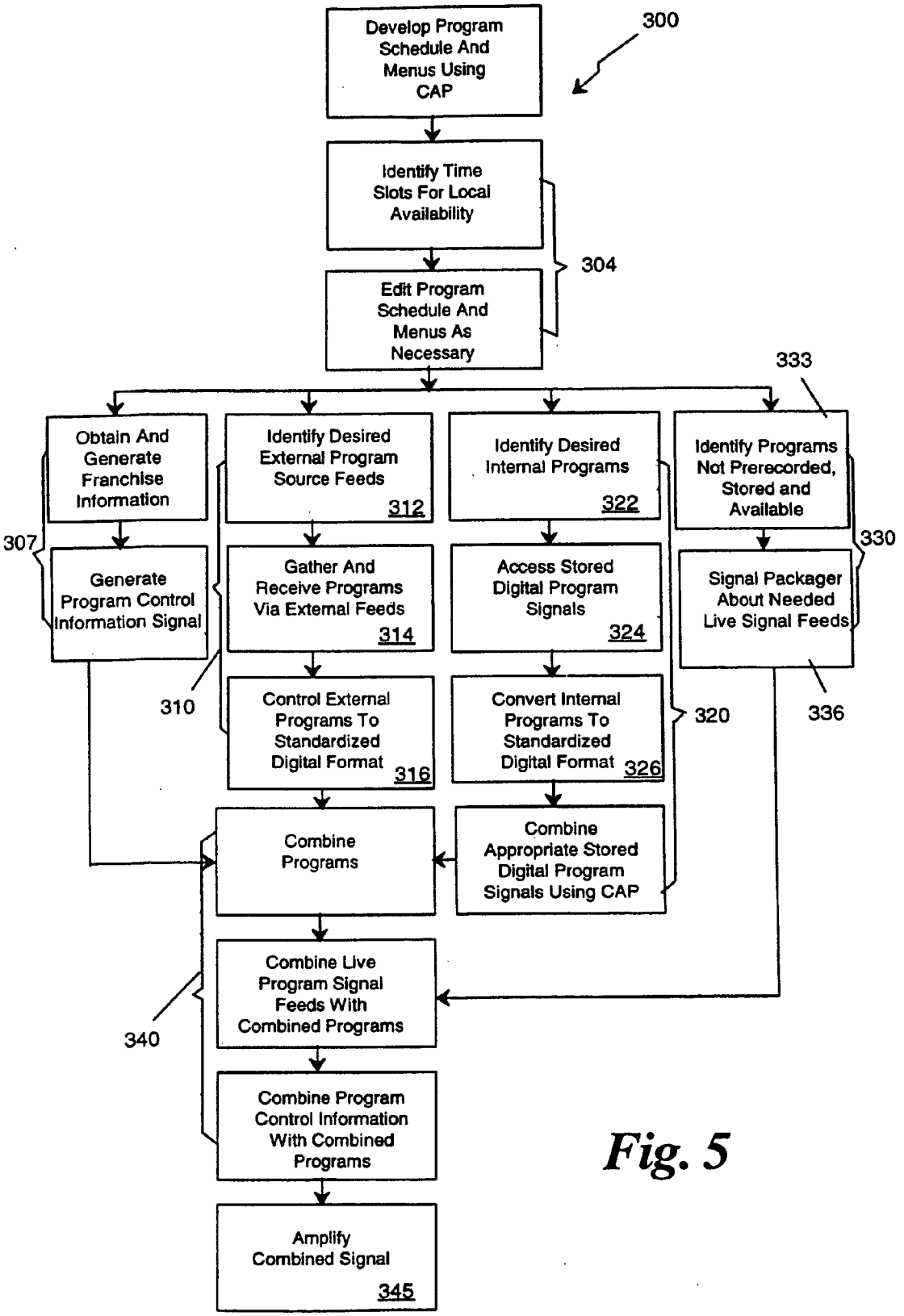

Develop Program Schedule And Menus Using CAP
300
Identify Time Slots For Local Availability
Edit Program Schedule And Menus As Necessary
304
333
Obtain And Generate Franchise Information
307
Generate Program Control Information Signal
Identify Desired External Program Source Feeds
312
Gather And Receive Programs Via External Feeds
314
310
Control External Programs To Standardized Digital Format
316
Identify Desired Internal Programs
322
Access Stored Digital Program Signals
324
Convert Internal Programs To Standardized Digital Format
326
320
Identify Programs Not Prerecorded, Stored and Available
330
Signal Packager About Needed Live Signal Feeds
336
Combine Programs
Combine Appropriate Stored Digital Program Signals Using CAP
Combine Live Program Signal Feeds With Combined Programs
340
Combine Program Control Information With Combined Programs
Amplify Combined Signal
345

Fig. 5

PROGRAM CONTROL INFORMATION
Chronologically by Channel

12:00 PM

*Program name	*Program length	*Menu code	*Description	*Video
1 Cheers	.5	E24	C	N
2 Terminator	2.0	A33	Tx	S
3 PrimeTime	1.0	D14	N	N
4 Football Special	.5	B24	S	N
•				
•				
•				
•				

12:30 PM

1 Simpsons	.5	E14 & C13	A	S
4 FootballGame	3.0	B13	S	N
•				
•				
•				

1:00 PM

1 Jaws	2.0	E16	Tx	S
3 Bugs Buny	1.0	C25	A	N
•				
•				
•				

1:30 PM

•				
•				
•				

Fig. 6

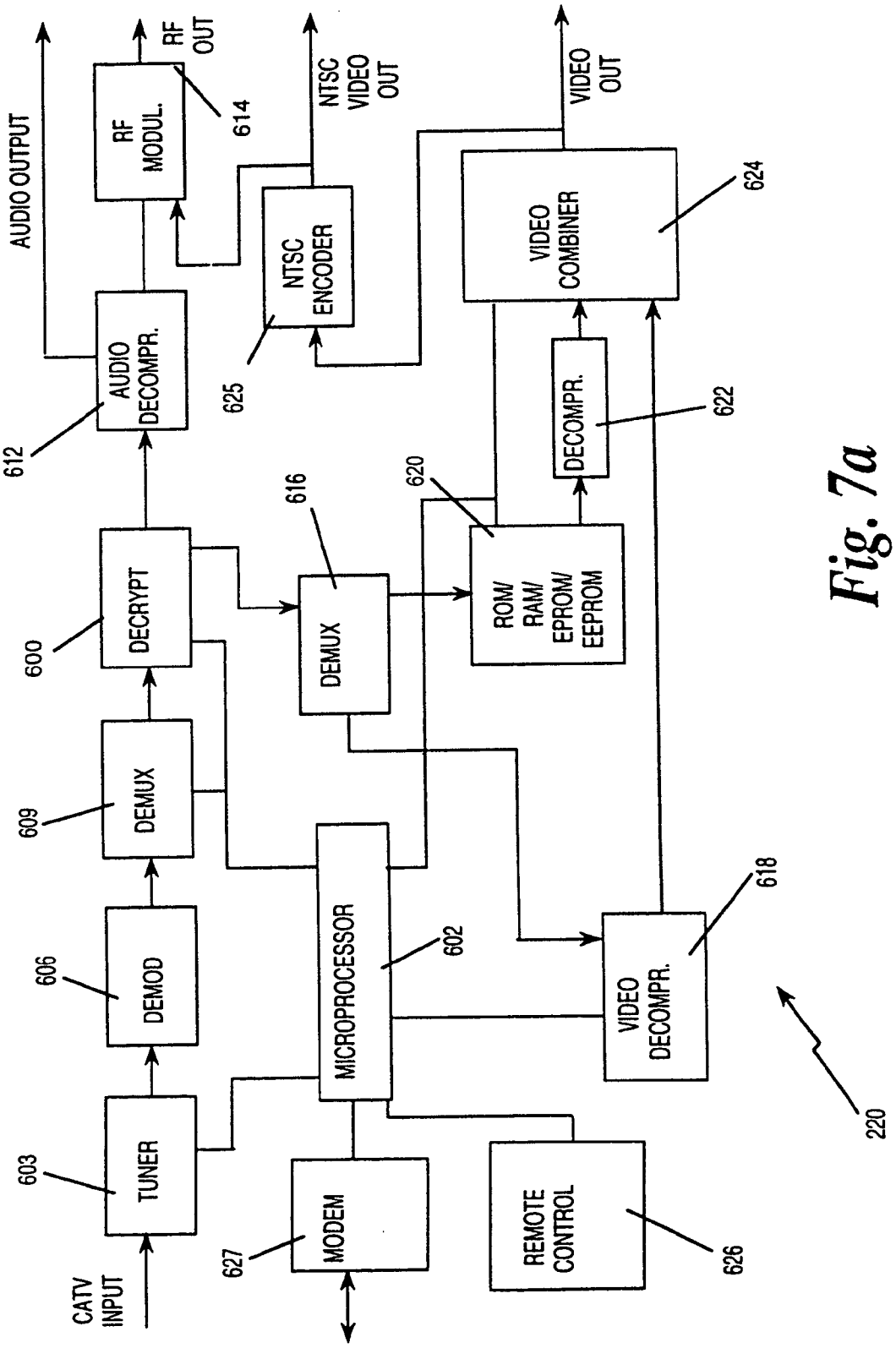

CATV INPUT
TUNER
603
DEMOD
606
DEMUX
609
DECRYPT
600
AUDIO DECOMPR.
612
AUDIO OUTPUT
RF MODUL.
614
RF OUT
NTSC ENCODER
625
NTSC VIDEO OUT
DEMUX
616
ROM/ RAM/ EPROM/ EEPROM
620
DECOMPR.
622
VIDEO COMBINER
624
VIDEO OUT
MICROPROCESSOR
602
VIDEO DECOMPR.
618
MODEM
627
REMOTE CONTROL
626
220

Fig. 7a

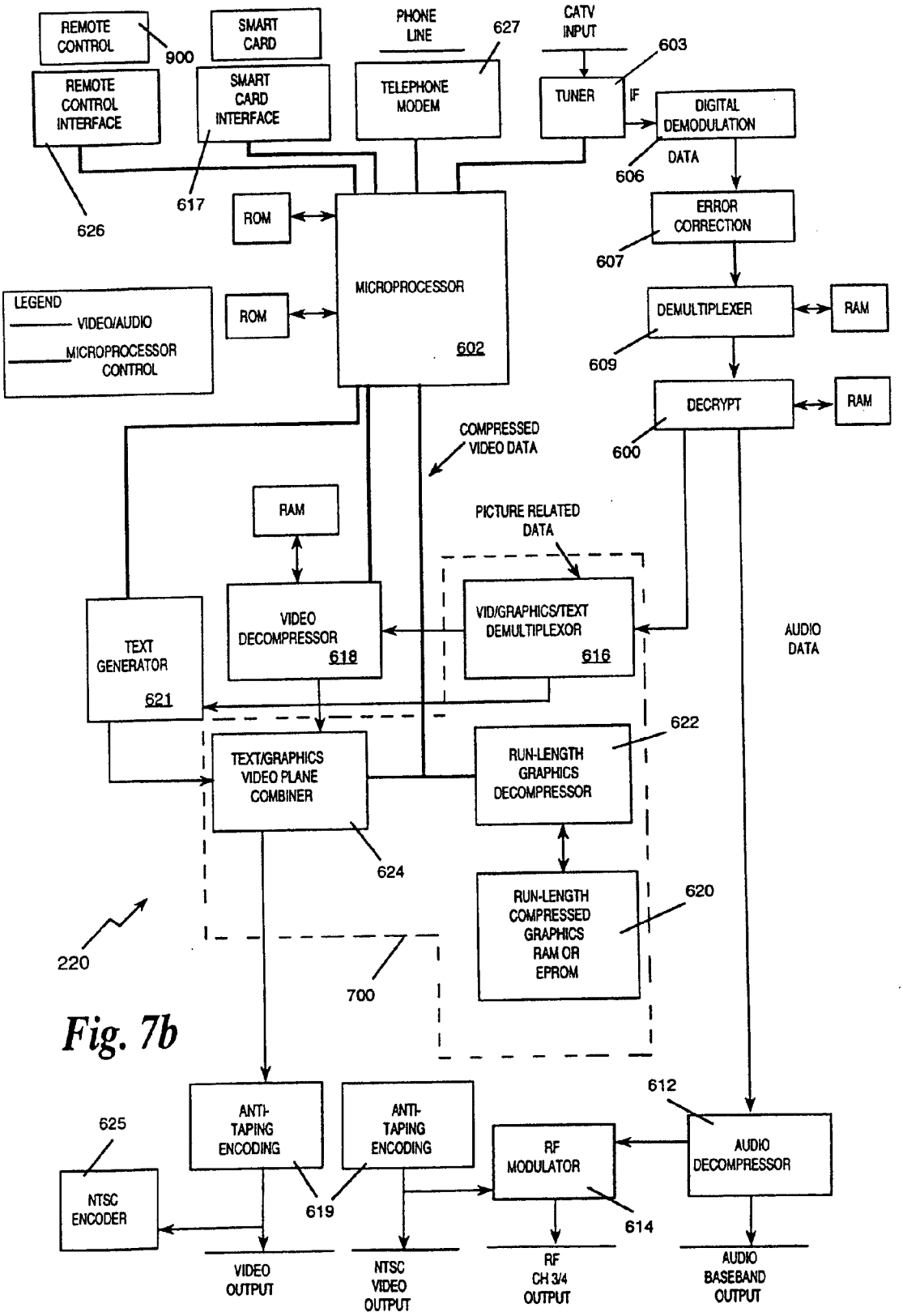

REMOTE CONTROL
900
SMART CARD
REMOTE CONTROL INTERFACE
SMART CARD INTERFACE
PHONE LINE
627
TELEPHONE MODEM
CATV INPUT
603
TUNER
IF
DIGITAL DEMODULATION
DATA
606
626
617
ROM
MICROPROCESSOR
602
ERROR CORRECTION
607
LEGEND
VIDEO/AUDIO
MICROPROCESSOR CONTROL
ROM
DEMULTIPLEXER
RAM
609
DECRYPT
RAM
600
COMPRESSED VIDEO DATA
RAM
PICTURE RELATED DATA
TEXT GENERATOR
621
VIDEO DECOMPRESSOR
618
VID/GRAPHICS/TEXT DEMULTIPLEXOR
616
AUDIO DATA
622
TEXT/GRAPHICS VIDEO PLANE COMBINER
RUN-LENGTH GRAPHICS DECOMPRESSOR
624
RUN-LENGTH COMPRESSED GRAPHICS RAM OR EPROM
620
220
700
612
625
ANTI-TAPING ENCODING
ANTI-TAPING ENCODING
RF MODULATOR
AUDIO DECOMPRESSOR
NTSC ENCODER
619
614
VIDEO OUTPUT
NTSC VIDEO OUTPUT
RF CH 3/4 OUTPUT
AUDIO BASEBAND OUTPUT

Fig. 7b

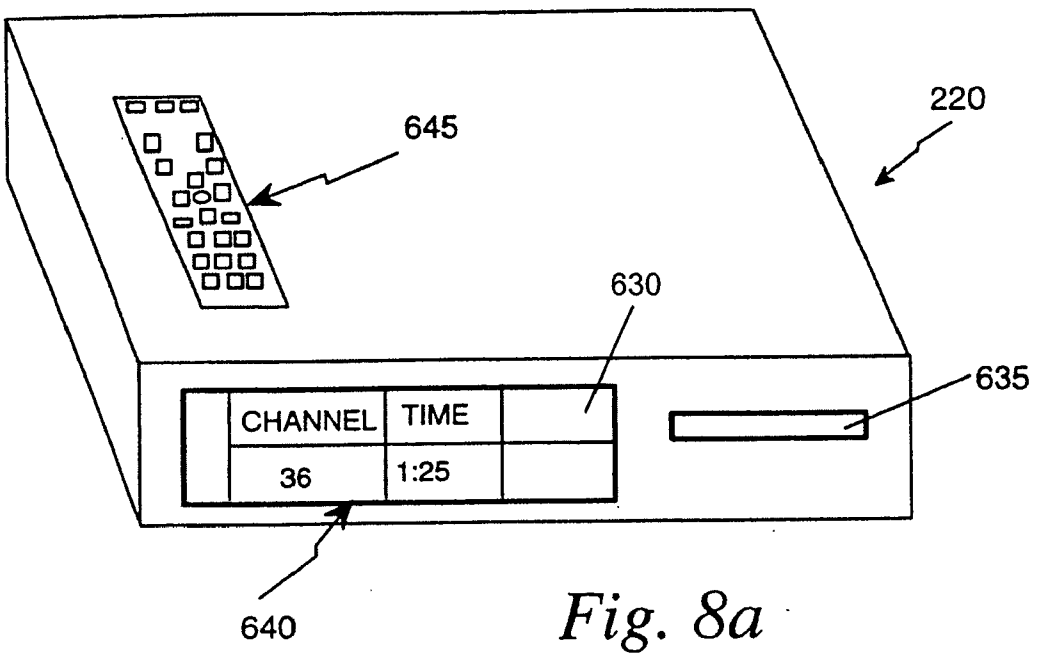

645
220
630
635
CHANNEL
TIME
36
1:25
640

Fig. 8a

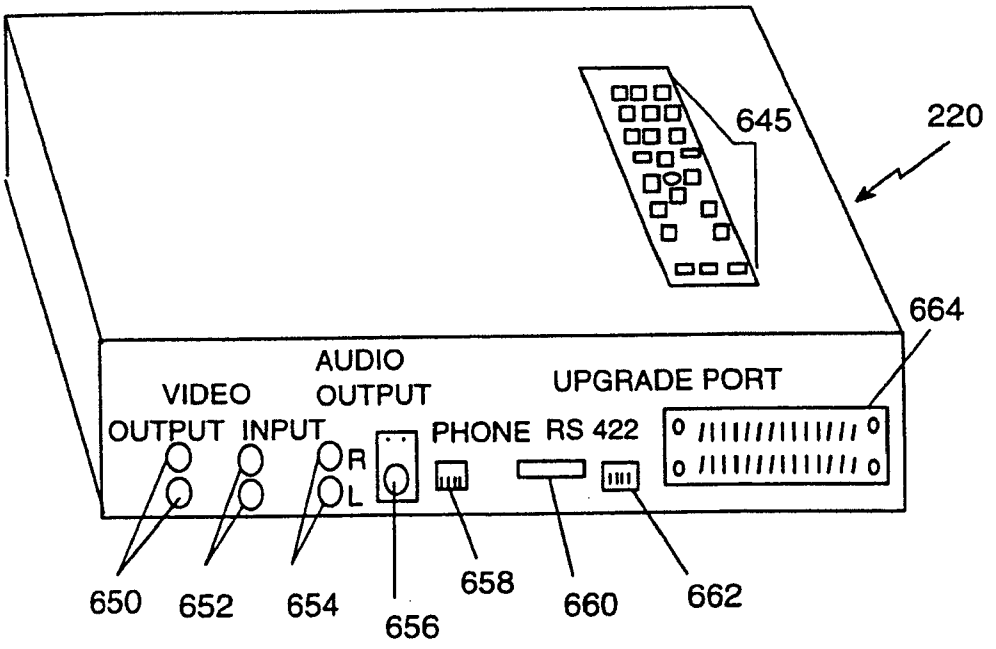

645
220
664
AUDIO
OUTPUT
VIDEO
OUTPUT
INPUT
R
L
PHONE
RS 422
UPGRADE PORT
650
652
654
656
658
660
662

Fig. 8b

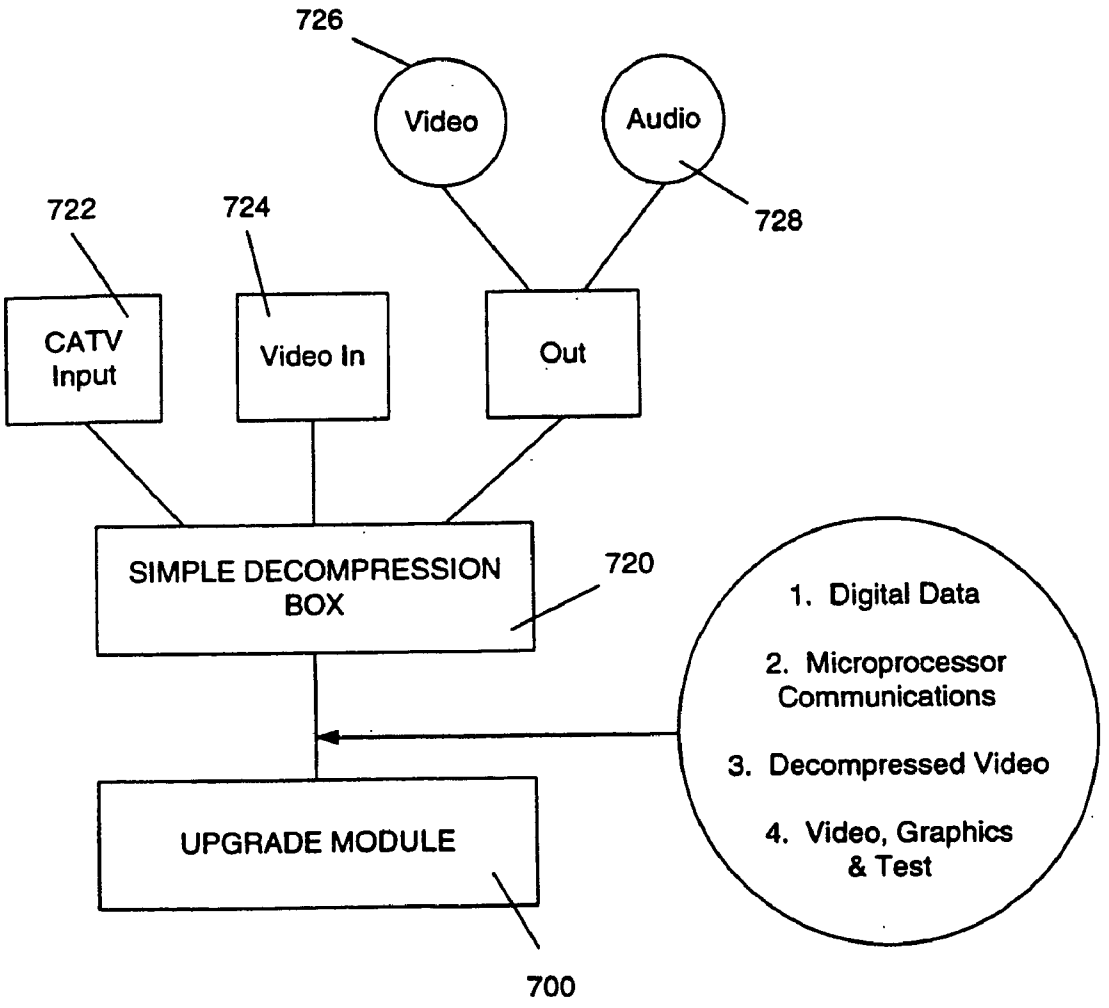

726
Video
Audio
728
722
724
CATV Input
Video In
Out
SIMPLE DECOMPRESSION BOX
720
1. Digital Data
2. Microprocessor Communications
3. Decompressed Video
4. Video, Graphics & Test
UPGRADE MODULE
700

Fig. 9a

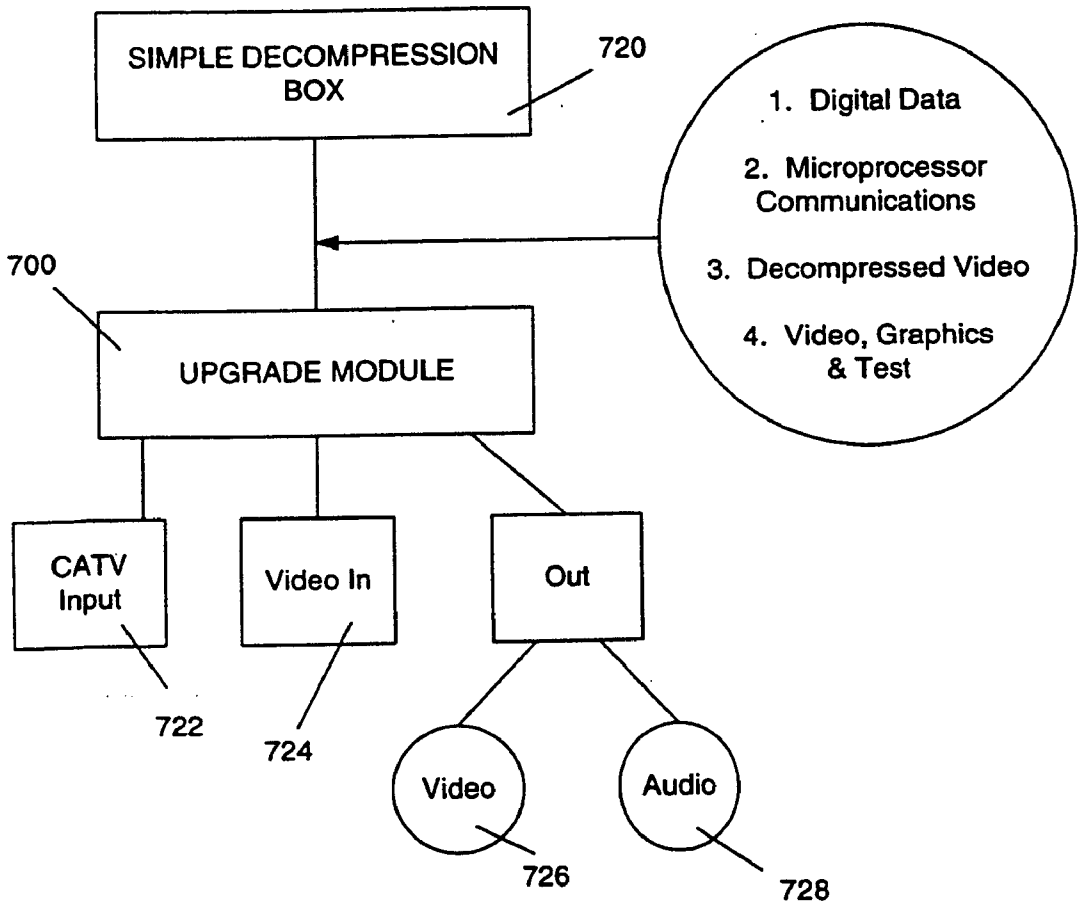

SIMPLE DECOMPRESSION BOX
720
1. Digital Data
2. Microprocessor Communications
3. Decompressed Video
4. Video, Graphics & Test
700
UPGRADE MODULE
CATV Input
Video In
Out
722
724
Video
Audio
726
728

Fig. 9b

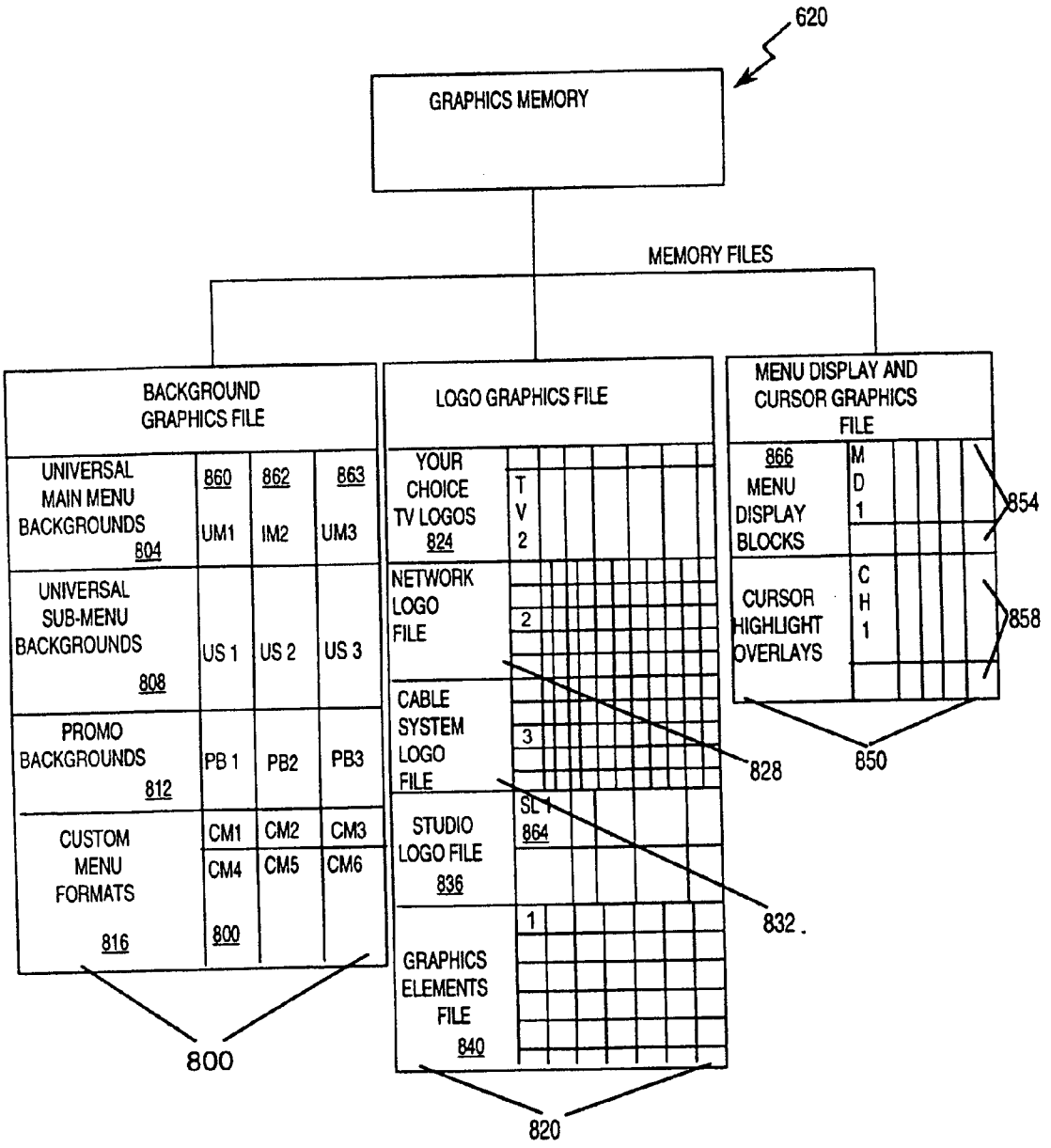

620
GRAPHICS MEMORY
MEMORY FILES
BACKGROUND GRAPHICS FILE
UNIVERSAL MAIN MENU BACKGROUNDS 804
860
862
863
UM1
IM2
UM3
UNIVERSAL SUB-MENU BACKGROUNDS 808
US 1
US 2
US 3
PROMO BACKGROUNDS 812
PB 1
PB2
PB3
CUSTOM MENU FORMATS 816
CM1
CM2
CM3
CM4
CM5
CM6
800
800
LOGO GRAPHICS FILE
YOUR CHOICE TV LOGOS 824
TV 2
NETWORK LOGO FILE
2
CABLE SYSTEM LOGO FILE
3
STUDIO LOGO FILE 836
SL 1 864
GRAPHICS ELEMENTS FILE 840
1
820
MENU DISPLAY AND CURSOR GRAPHICS FILE
866
MENU DISPLAY BLOCKS
MD 1
854
CURSOR HIGHLIGHT OVERLAYS
CH 1
858
850
828
832

Fig. 10a

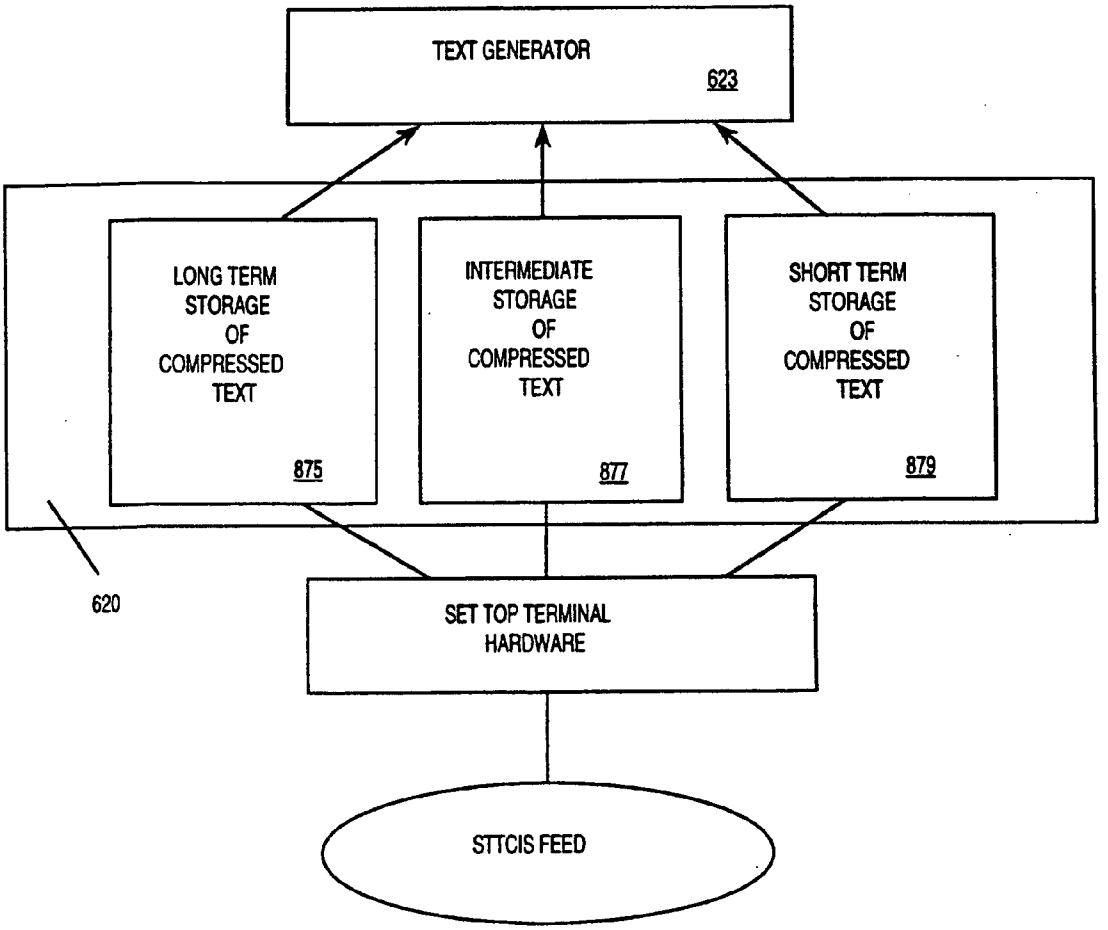

TEXT GENERATOR
623
LONG TERM STORAGE OF COMPRESSED TEXT
875
INTERMEDIATE STORAGE OF COMPRESSED TEXT
877
SHORT TERM STORAGE OF COMPRESSED TEXT
879
620
SET TOP TERMINAL HARDWARE
STTCIS FEED

Fig. 10b

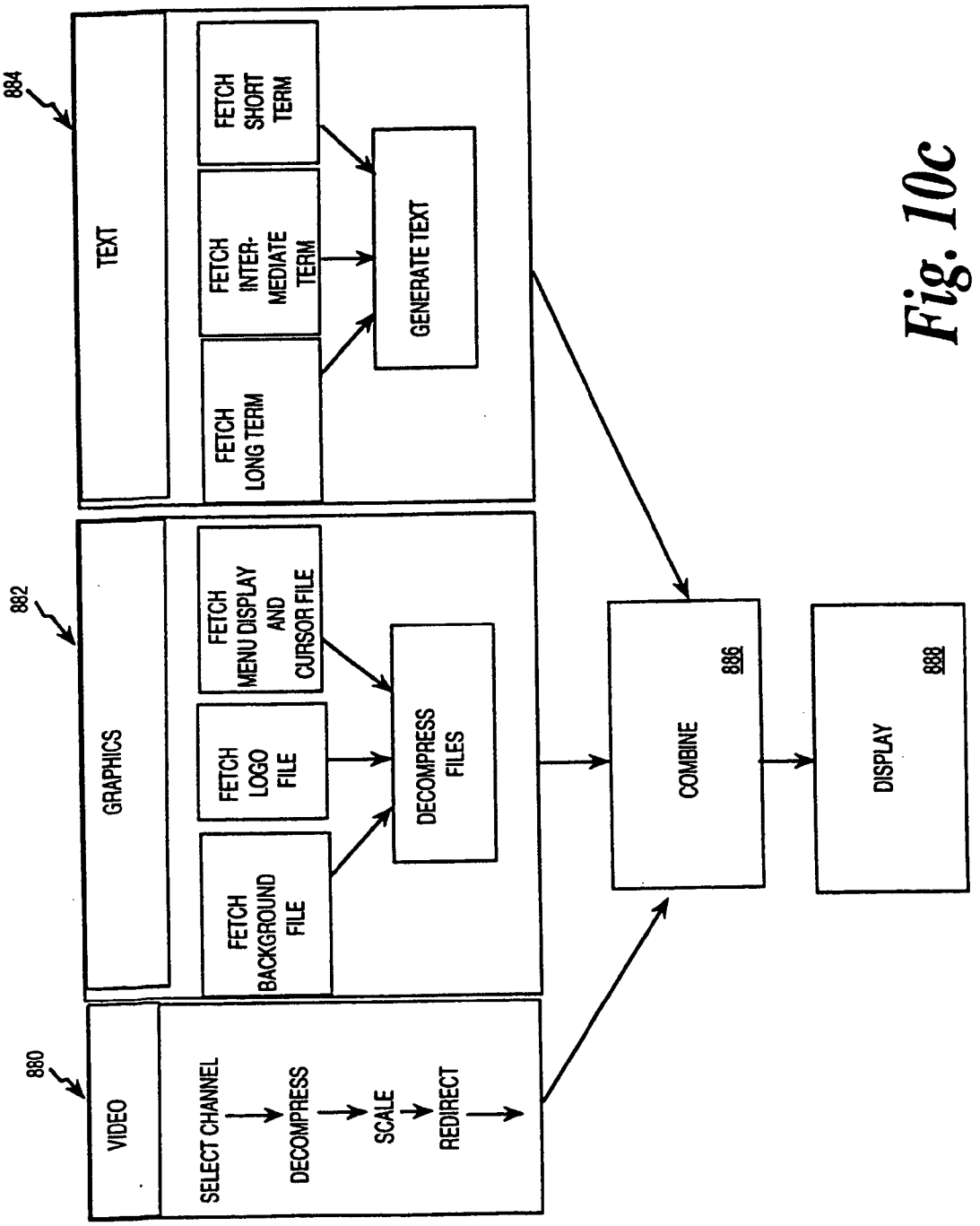

884
TEXT
FETCH SHORT TERM
FETCH INTER-MEDIATE TERM
FETCH LONG TERM
GENERATE TEXT
882
GRAPHICS
FETCH MENU DISPLAY AND CURSOR FILE
FETCH LOGO FILE
FETCH BACKGROUND FILE
DECOMPRESS FILES
880
VIDEO
SELECT CHANNEL
DECOMPRESS
SCALE
REDIRECT
COMBINE
886
DISPLAY
888

Fig. 10c

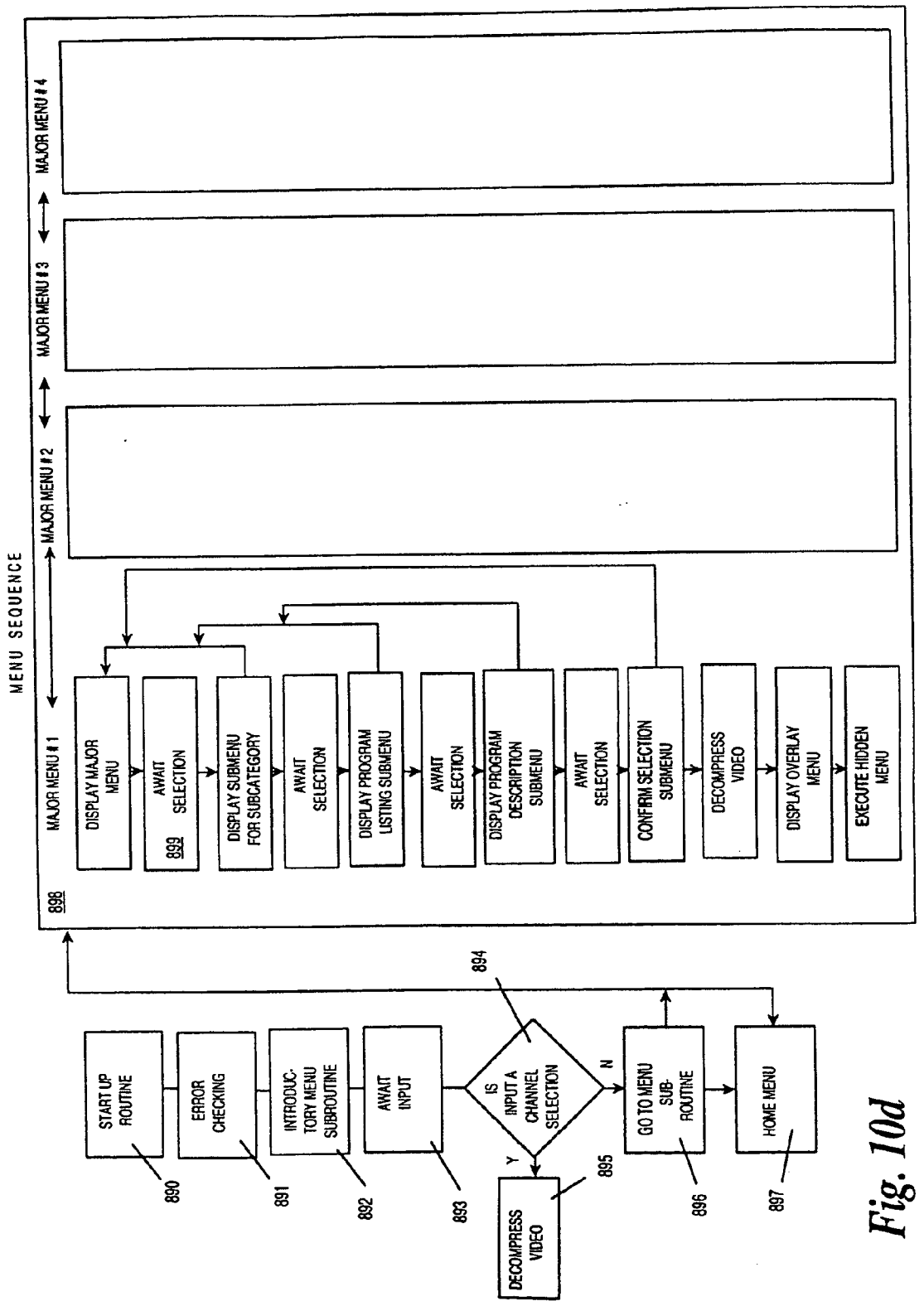
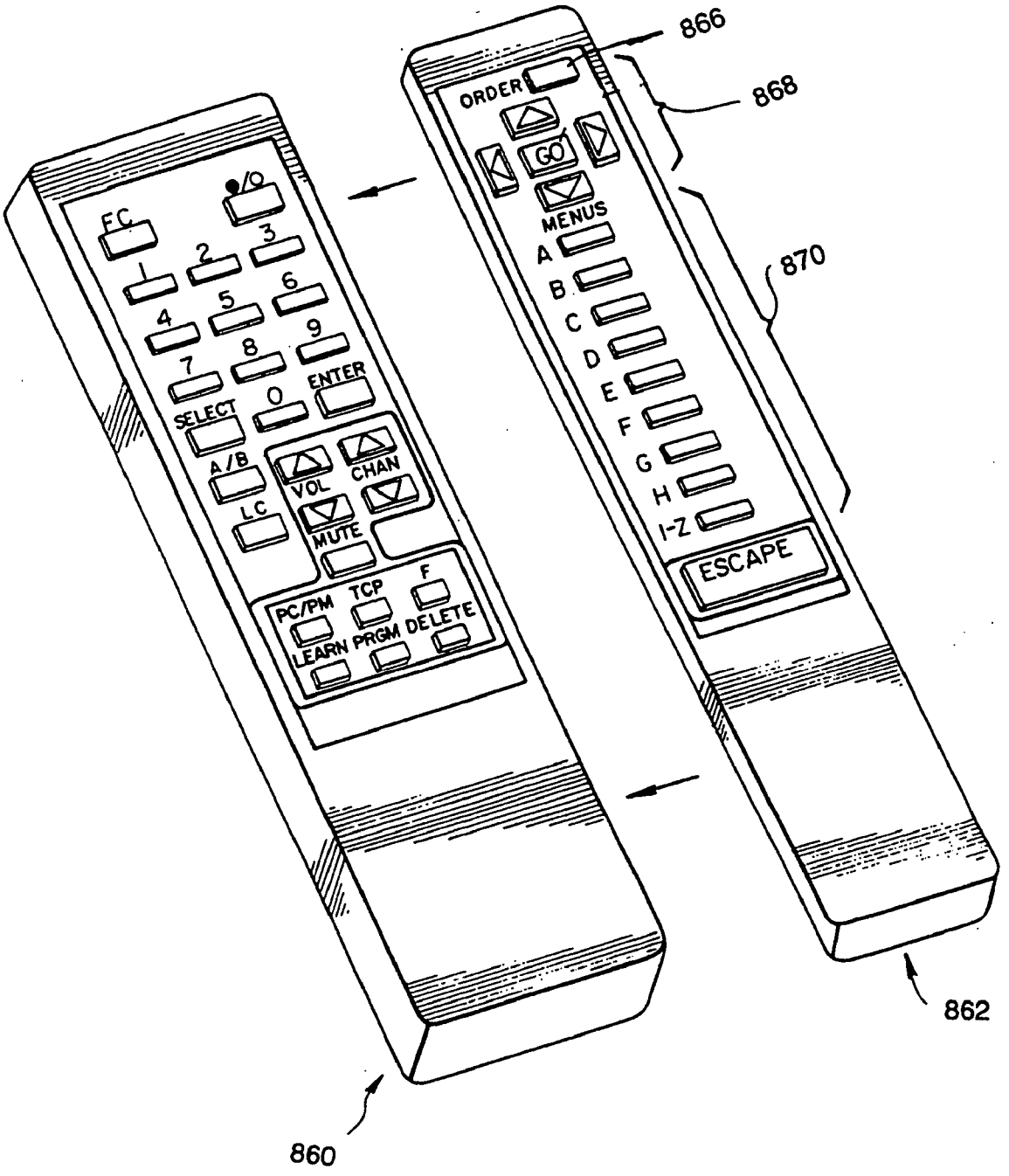

MENU SEQUENCE
MAJOR MENU # 1
MAJOR MENU # 2
MAJOR MENU # 3
MAJOR MENU # 4
898
DISPLAY MAJOR MENU
AWAIT SELECTION
899
DISPLAY SUBMENU FOR SUBCATEGORY
AWAIT SELECTION
DISPLAY PROGRAM LISTING SUBMENU
AWAIT SELECTION
DISPLAY PROGRAM DESCRIPTION SUBMENU
AWAIT SELECTION
CONFIRM SELECTION SUBMENU
DECOMPRESS VIDEO
DISPLAY OVERLAY MENU
EXECUTE HIDDEN MENU
START UP ROUTINE
ERROR CHECKING
INTRODUC-TORY MENU SUBROUTINE
AWAIT INPUT
IS INPUT A CHANNEL SELECTION
894
Y
N
DECOMPRESS VIDEO
GO TO MENU SUB-ROUTINE
HOME MENU
890
891
892
893
895
896
897

Fig. 10d

Fig. 11a


866
868
870
862
860
ORDER
GO
MENUS
A
B
C
D
E
F
G
H
I-Z
ESCAPE
FC
1
2
3
4
5
6
7
8
9
SELECT
0
ENTER
A/B
LC
VOL
CHAN
MUTE
PC/PM
TCP
F
LEARN
PRGM
DELETE

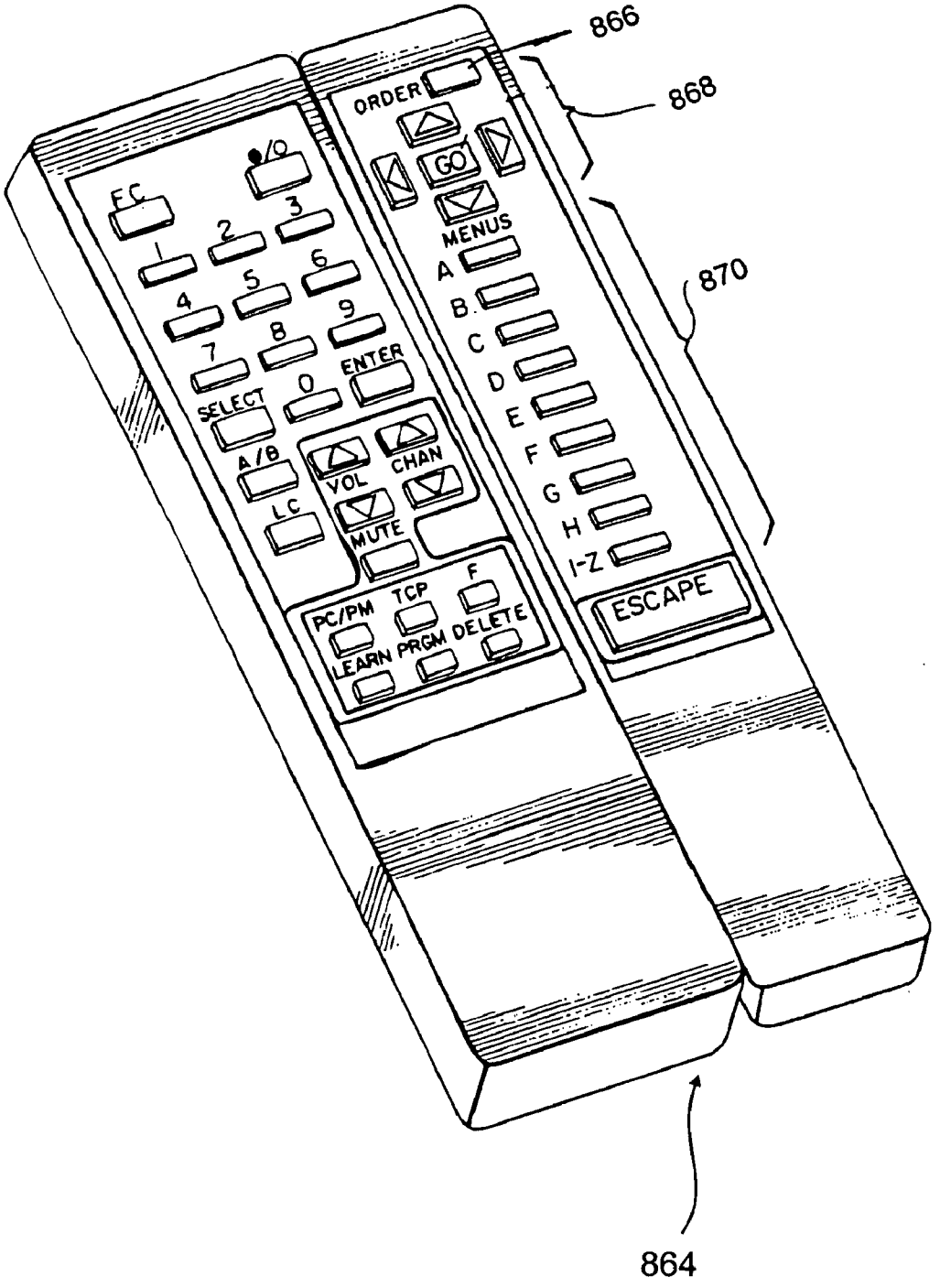

866
868
870
ORDER
GO
MENUS
A
B
C
D
E
F
G
H
I-Z
ESCAPE
FC
1
2
3
4
5
6
7
8
9
0
ENTER
SELECT
A/B
LC
VOL
CHAN
MUTE
PC/PM
TCP
F
LEARN
PRGM
DELETE
864

Fig. 11b

Fig. 12a

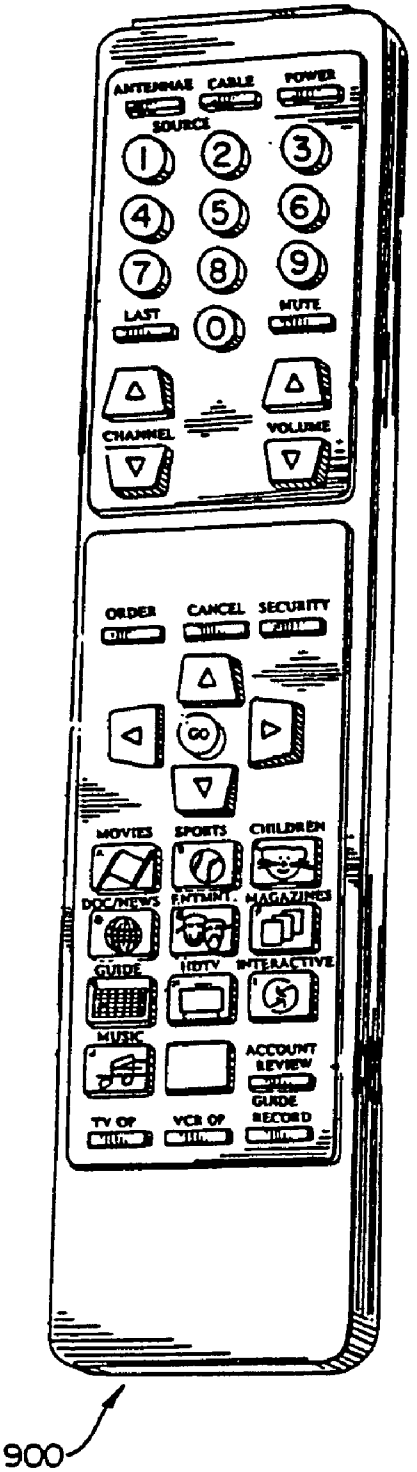
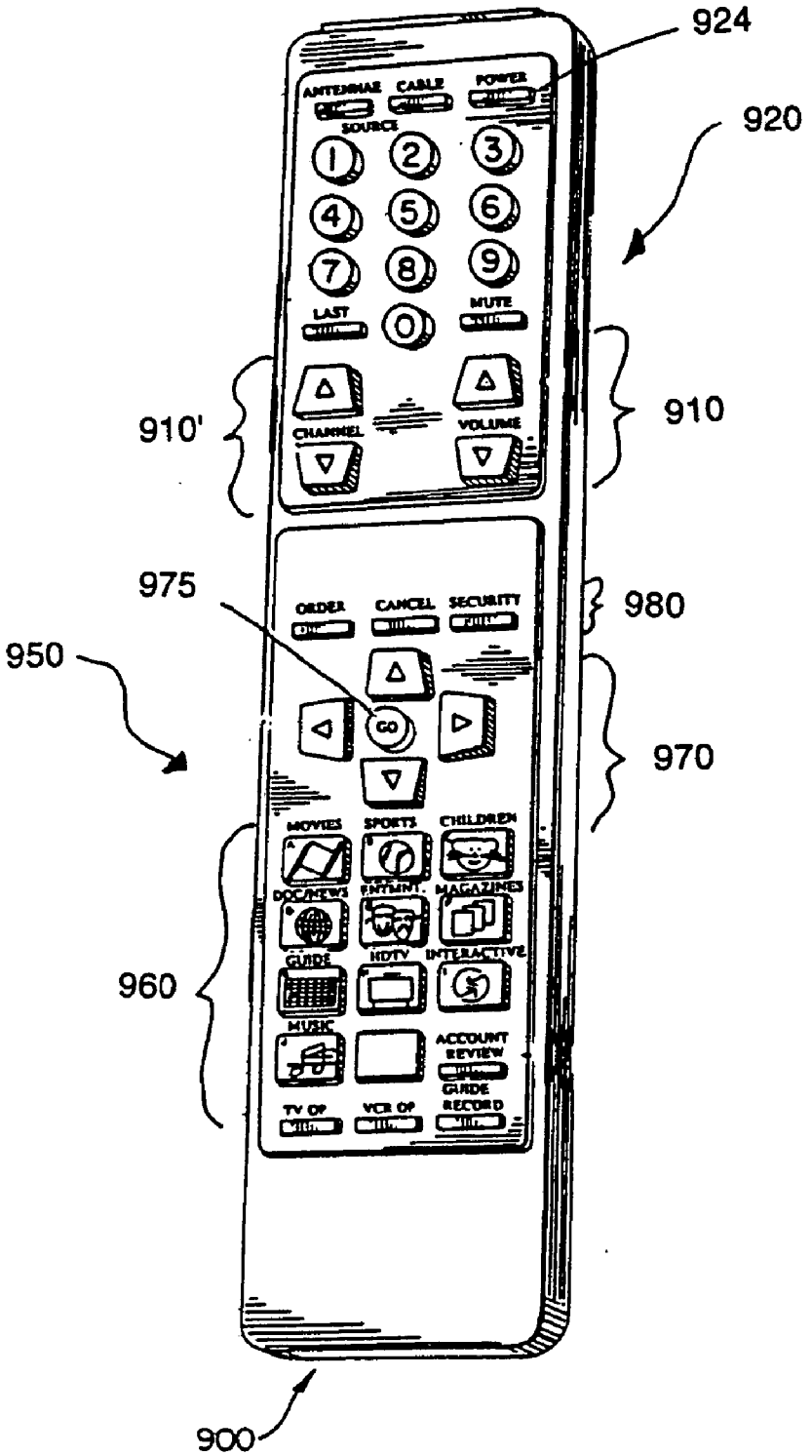

ANTENNAE
CABLE
POWER
SOURCE
1
2
3
4
5
6
7
8
9
LAST
0
MUTE
CHANNEL
VOLUME
ORDER
CANCEL
SECURITY
MOVIES
SPORTS
CHILDREN
DOC/NEWS
ENTMNT.
MAGAZINES
GUIDE
HDTV
INTERACTIVE
MUSIC
ACCOUNT REVIEW
GUIDE
TV OP
VCR OP
RECORD
900

Fig. 12b


924
920
910'
910
975
980
950
970
960
900
ANTENNAE
CABLE
POWER
SOURCE
LAST
MUTE
CHANNEL
VOLUME
ORDER
CANCEL
SECURITY
GO
MOVIES
SPORTS
CHILDREN
GUIDE
HDTV
INTERACTIVE
MUSIC
ACCOUNT REVIEW
GUIDE
TV CP
VCR CP
RECORD

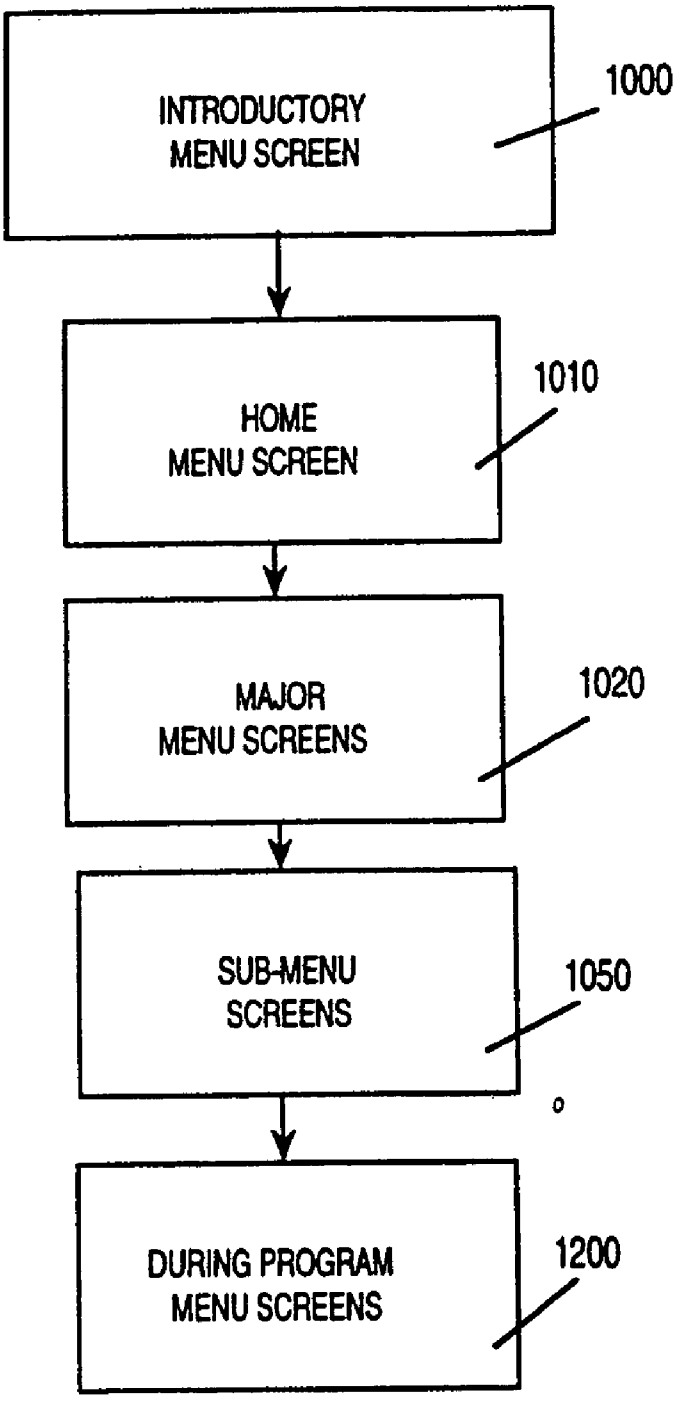

INTRODUCTORY MENU SCREEN
1000
HOME MENU SCREEN
1010
MAJOR MENU SCREENS
1020
SUB-MENU SCREENS
1050
DURING PROGRAM MENU SCREENS
1200

Fig. 13

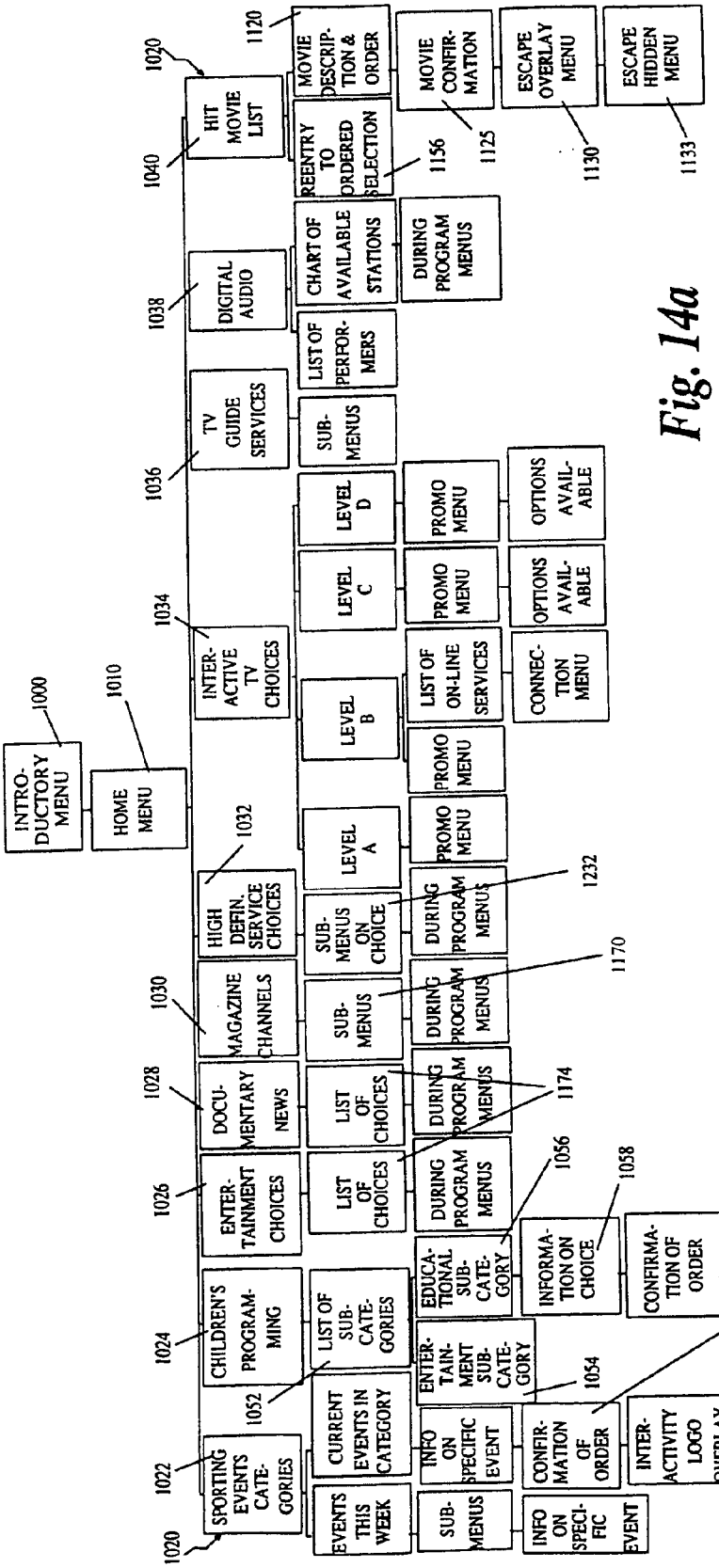

INTRO-DUCTORY MENU
1000
HOME MENU
1010
INTER-ACTIVE TV CHOICES
1034
TV GUIDE SERVICES
1036
DIGITAL AUDIO
1038
HIT MOVIE LIST
1040
1020
MOVIE DESCRIP-TION & ORDER
1120
REENTRY TO ORDERED SELECTION
1156
MOVIE CONFIR-MATION
1125
ESCAPE OVERLAY MENU
1130
ESCAPE HIDDEN MENU
1133
CHART OF AVAILABLE STATIONS
DURING PROGRAM MENUS
LIST OF PERFOR-MERS
SUB-MENUS
LEVEL D
PROMO MENU
OPTIONS AVAIL-ABLE
LEVEL C
PROMO MENU
OPTIONS AVAIL-ABLE
LIST OF ON-LINE SERVICES
CONNEC-TION MENU
LEVEL B
PROMO MENU
LEVEL A
PROMO MENU
HIGH DEFIN. SERVICE CHOICES
1032
SUB-MENUS ON CHOICE
DURING PROGRAM MENUS
1232
MAGAZINE CHANNELS
1030
SUB-MENUS
DURING PROGRAM MENUS
1170
DOCU-MENTARY NEWS
1028
LIST OF CHOICES
DURING PROGRAM MENUS
1174
ENTER-TAINMENT CHOICES
1026
LIST OF CHOICES
DURING PROGRAM MENUS
CHILDREN'S PROGRAM-MING
1024
LIST OF SUB-CATE-GORIES
EDUCA-TIONAL SUB-CATE-GORY
1056
INFORMA-TION ON CHOICE
1058
CONFIRMA-TION OF ORDER
1060
ENTER-TAIN-MENT SUB-CATE-GORY
1054
SPORTING EVENTS CATE-GORIES
1022
CURRENT EVENTS IN CATEGORY
1052
INFO ON SPECIFIC EVENT
CONFIR-MATION OF ORDER
INTER-ACTIVITY LOGO OVERLAY
HIDDEN MENUS
1020
EVENTS THIS WEEK
SUB-MENUS
INFO ON SPECI-FIC EVENT

Fig. 14a

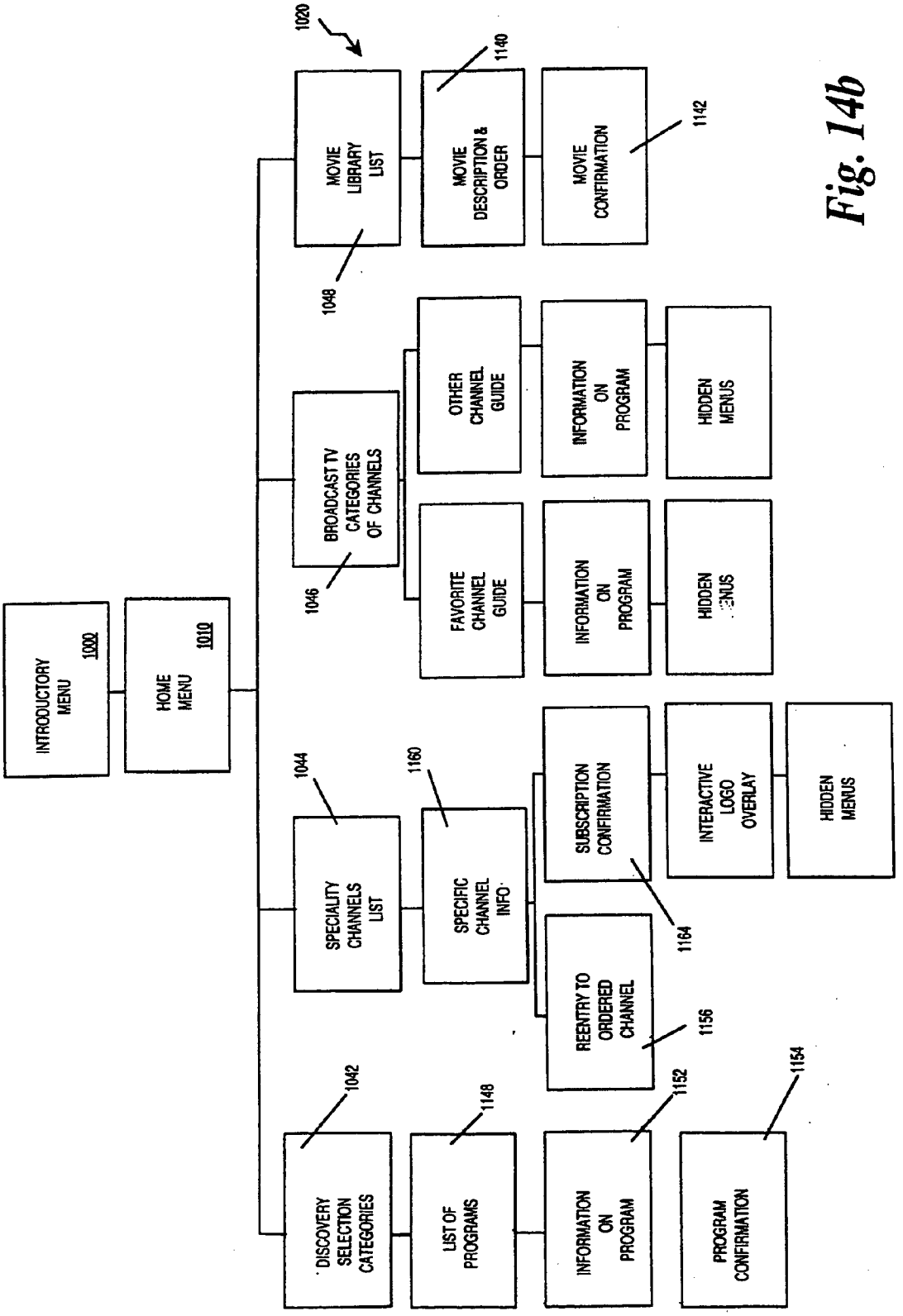

INTRODUCTORY MENU 1000
HOME MENU 1010
1020
MOVIE LIBRARY LIST
MOVIE DESCRIPTION & ORDER 1140
MOVIE CONFIRMATION 1142
1048
BROADCAST TV CATEGORIES OF CHANNELS
1046
OTHER CHANNEL GUIDE
INFORMATION ON PROGRAM
HIDDEN MENUS
FAVORITE CHANNEL GUIDE
INFORMATION ON PROGRAM
HIDDEN MENUS
1044
SPECIALITY CHANNELS LIST
1160
SPECIFIC CHANNEL INFO
SUBSCRIPTION CONFIRMATION
INTERACTIVE LOGO OVERLAY
HIDDEN MENUS
1164
REENTRY TO ORDERED CHANNEL
1156
1042
DISCOVERY SELECTION CATEGORIES
1148
LIST OF PROGRAMS
1152
INFORMATION ON PROGRAM
1154
PROGRAM CONFIRMATION

Fig. 14b

Fig. 15a

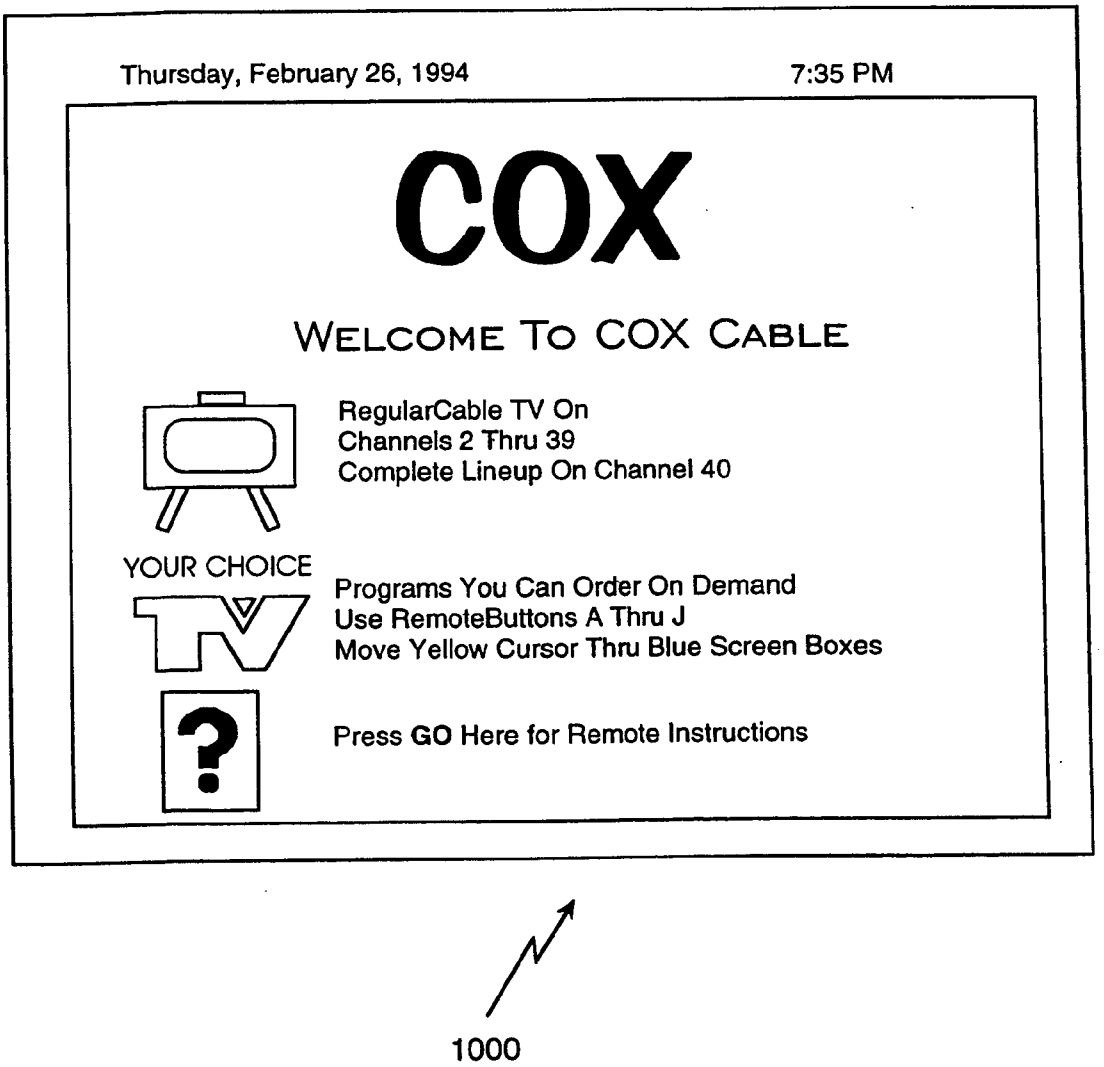
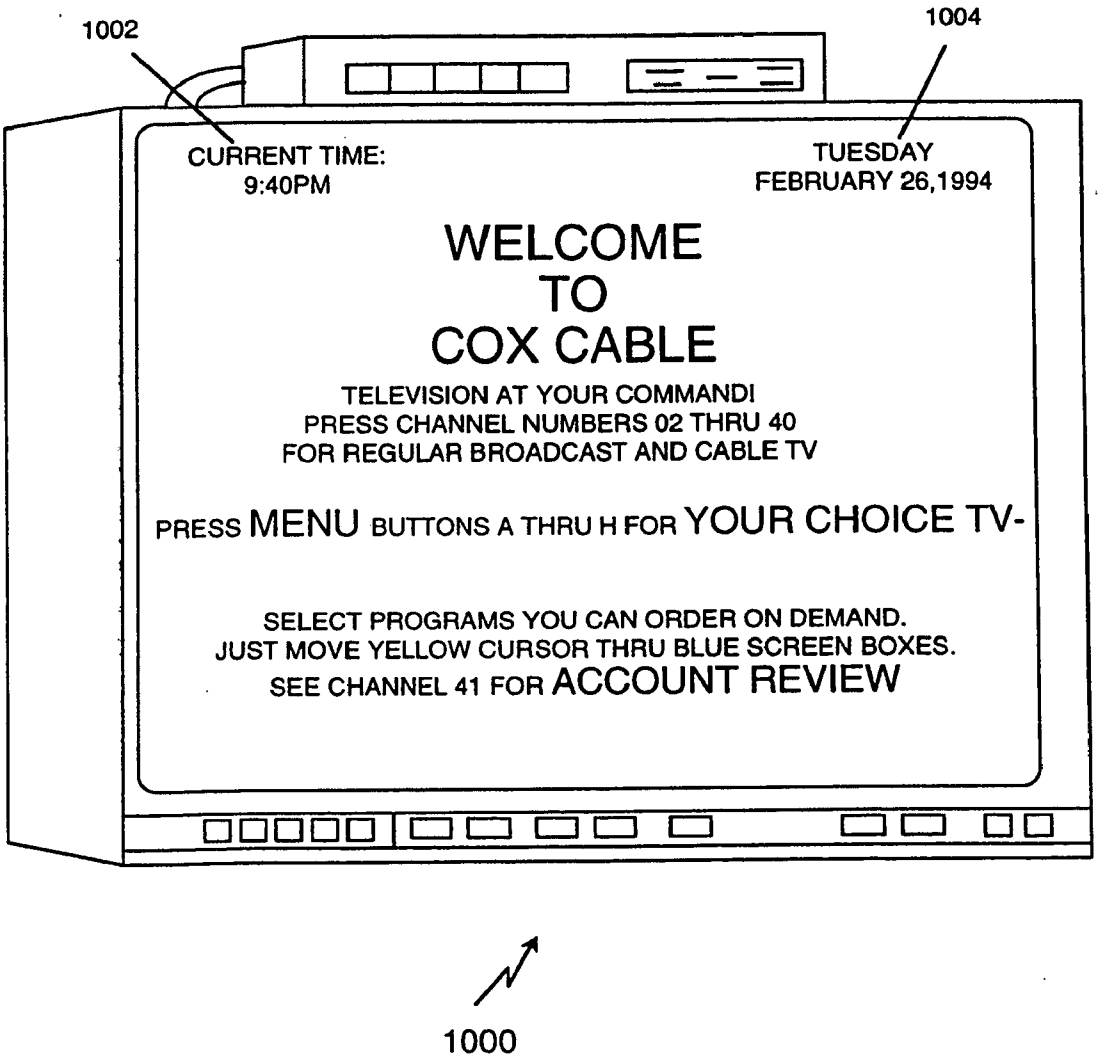

Thursday, February 26, 1994
7:35 PM
COX
WELCOME TO COX CABLE
RegularCable TV On
Channels 2 Thru 39
Complete Lineup On Channel 40
YOUR CHOICE
TV
Programs You Can Order On Demand
Use RemoteButtons A Thru J
Move Yellow Cursor Thru Blue Screen Boxes
?
Press GO Here for Remote Instructions
1000

Fig. 15b


1002
1004
CURRENT TIME:
9:40PM
TUESDAY
FEBRUARY 26,1994
WELCOME
TO
COX CABLE
TELEVISION AT YOUR COMMAND!
PRESS CHANNEL NUMBERS 02 THRU 40
FOR REGULAR BROADCAST AND CABLE TV
PRESS MENU BUTTONS A THRU H FOR YOUR CHOICE TV-
SELECT PROGRAMS YOU CAN ORDER ON DEMAND.
JUST MOVE YELLOW CURSOR THRU BLUE SCREEN BOXES.
SEE CHANNEL 41 FOR ACCOUNT REVIEW
1000

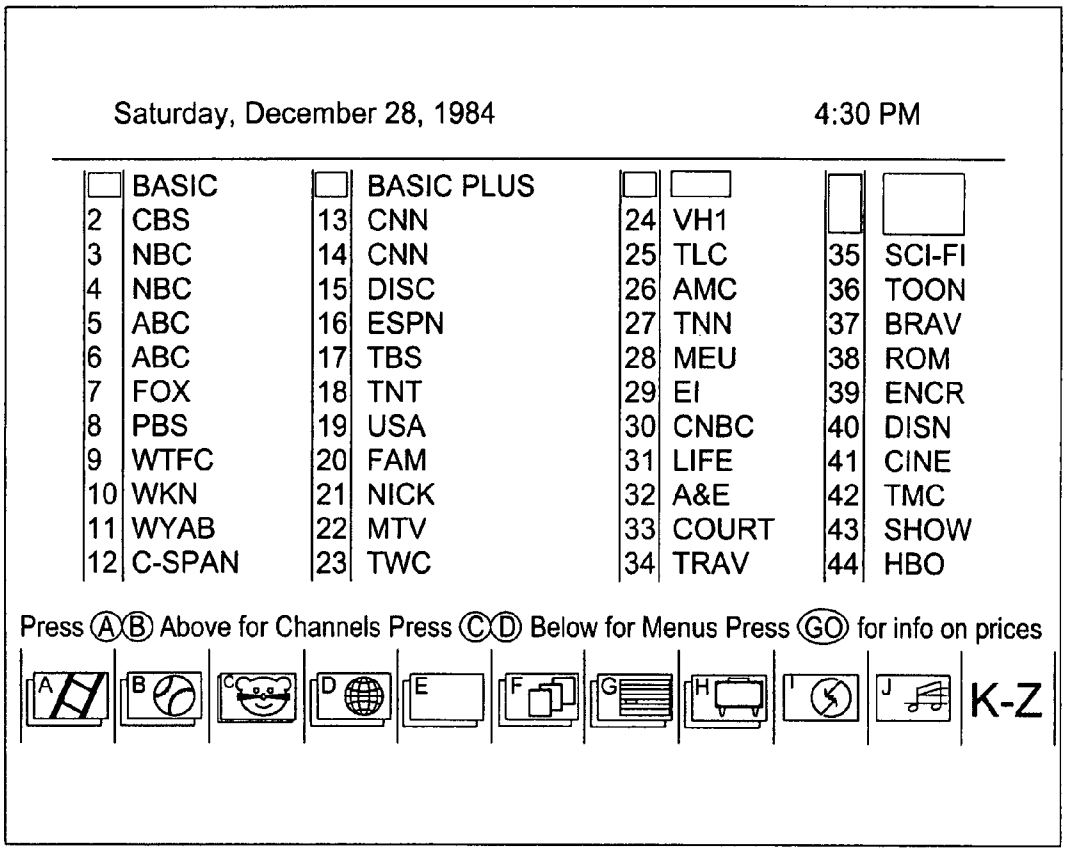

Saturday, December 28, 1984
4:30 PM
BASIC
2 CBS
3 NBC
4 NBC
5 ABC
6 ABC
7 FOX
8 PBS
9 WTFC
10 WKN
11 WYAB
12 C-SPAN
BASIC PLUS
13 CNN
14 CNN
15 DISC
16 ESPN
17 TBS
18 TNT
19 USA
20 FAM
21 NICK
22 MTV
23 TWC
24 VH1
25 TLC
26 AMC
27 TNN
28 MEU
29 EI
30 CNBC
31 LIFE
32 A&E
33 COURT
34 TRAV
35 SCI-FI
36 TOON
37 BRAV
38 ROM
39 ENCR
40 DISN
41 CINE
42 TMC
43 SHOW
44 HBO
Press AB Above for Channels Press CD Below for Menus Press GO for info on prices
A
B
C
D
E
F
G
H
I
J
K-Z
1010

FIG. 16a

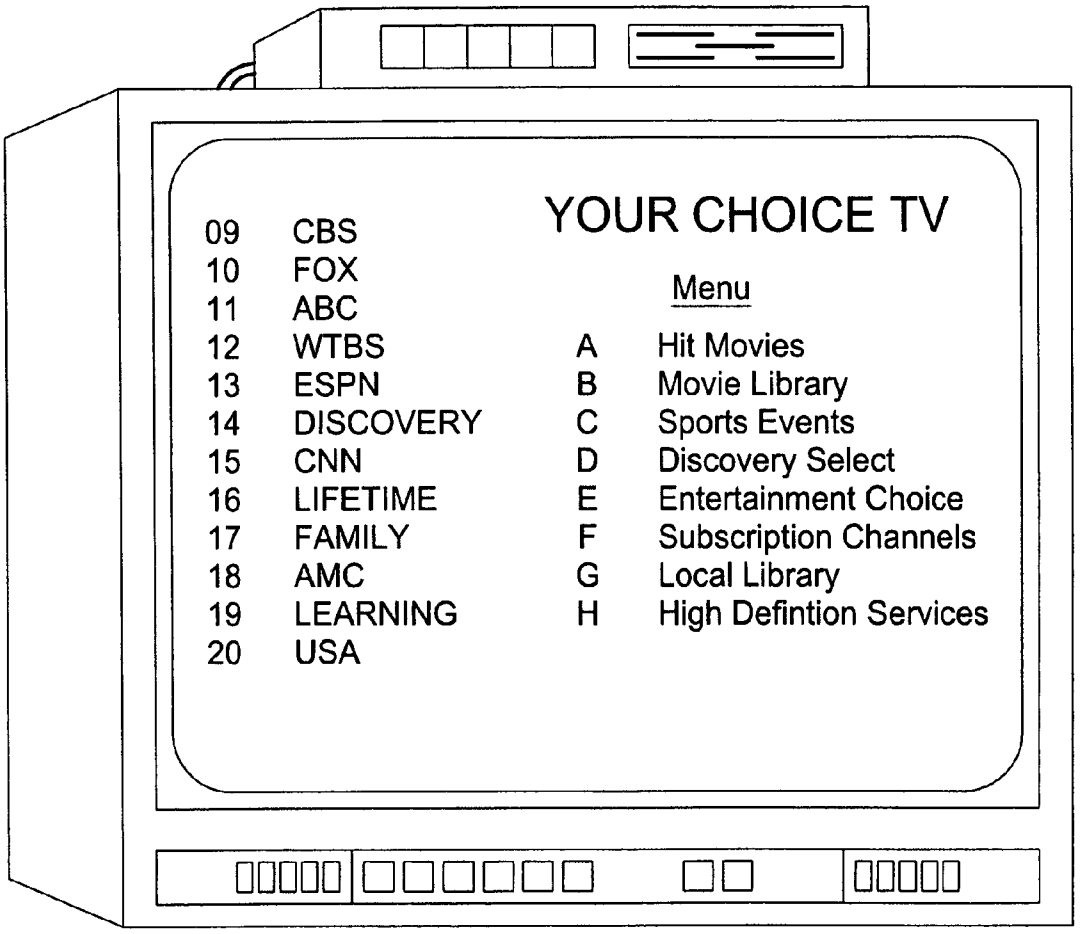

YOUR CHOICE TV
09 CBS
10 FOX
11 ABC
12 WTBS
13 ESPN
14 DISCOVERY
15 CNN
16 LIFETIME
17 FAMILY
18 AMC
19 LEARNING
20 USA
Menu
A Hit Movies
B Movie Library
C Sports Events
D Discovery Select
E Entertainment Choice
F Subscription Channels
G Local Library
H High Defintion Services

FIG. 16b

1010

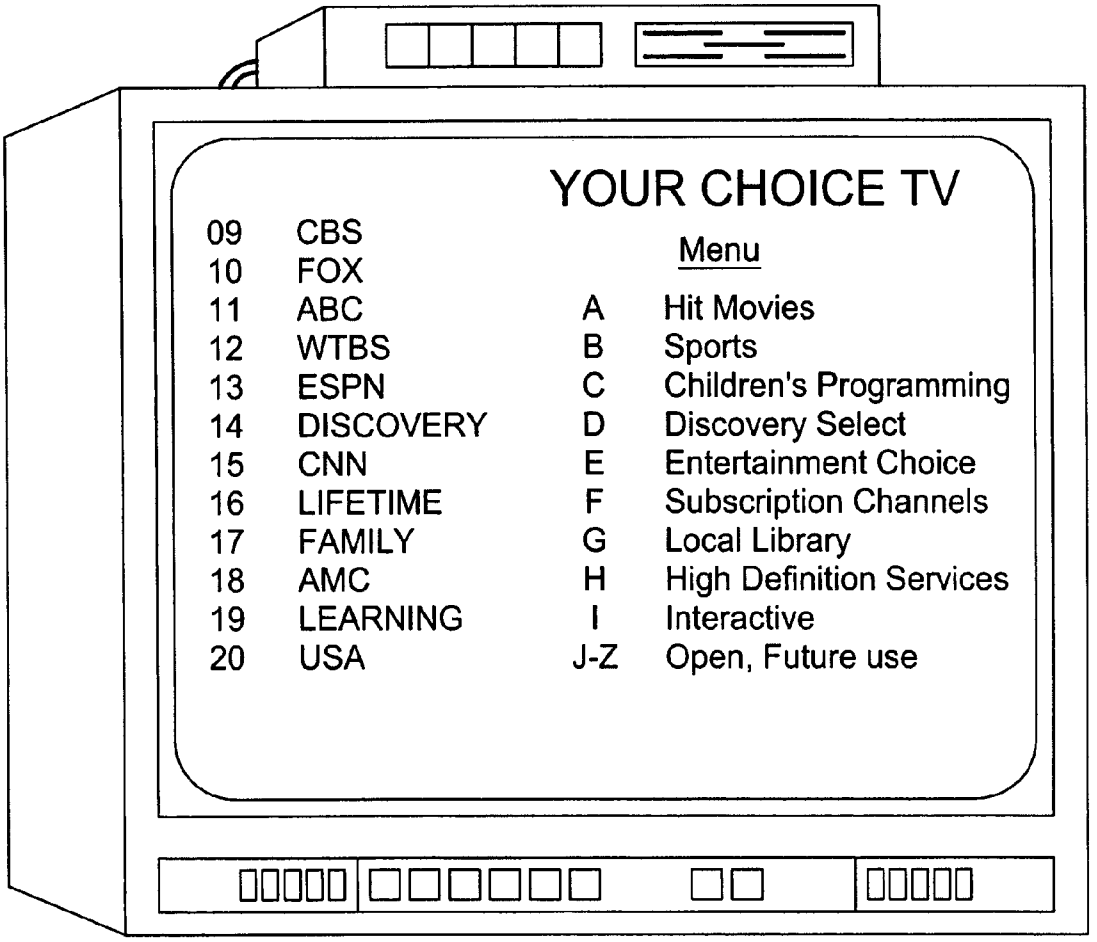

YOUR CHOICE TV
09 CBS
10 FOX
11 ABC
12 WTBS
13 ESPN
14 DISCOVERY
15 CNN
16 LIFETIME
17 FAMILY
18 AMC
19 LEARNING
20 USA
Menu
A Hit Movies
B Sports
C Children's Programming
D Discovery Select
E Entertainment Choice
F Subscription Channels
G Local Library
H High Definition Services
I Interactive
J-Z Open, Future use
1010

FIG. 16c

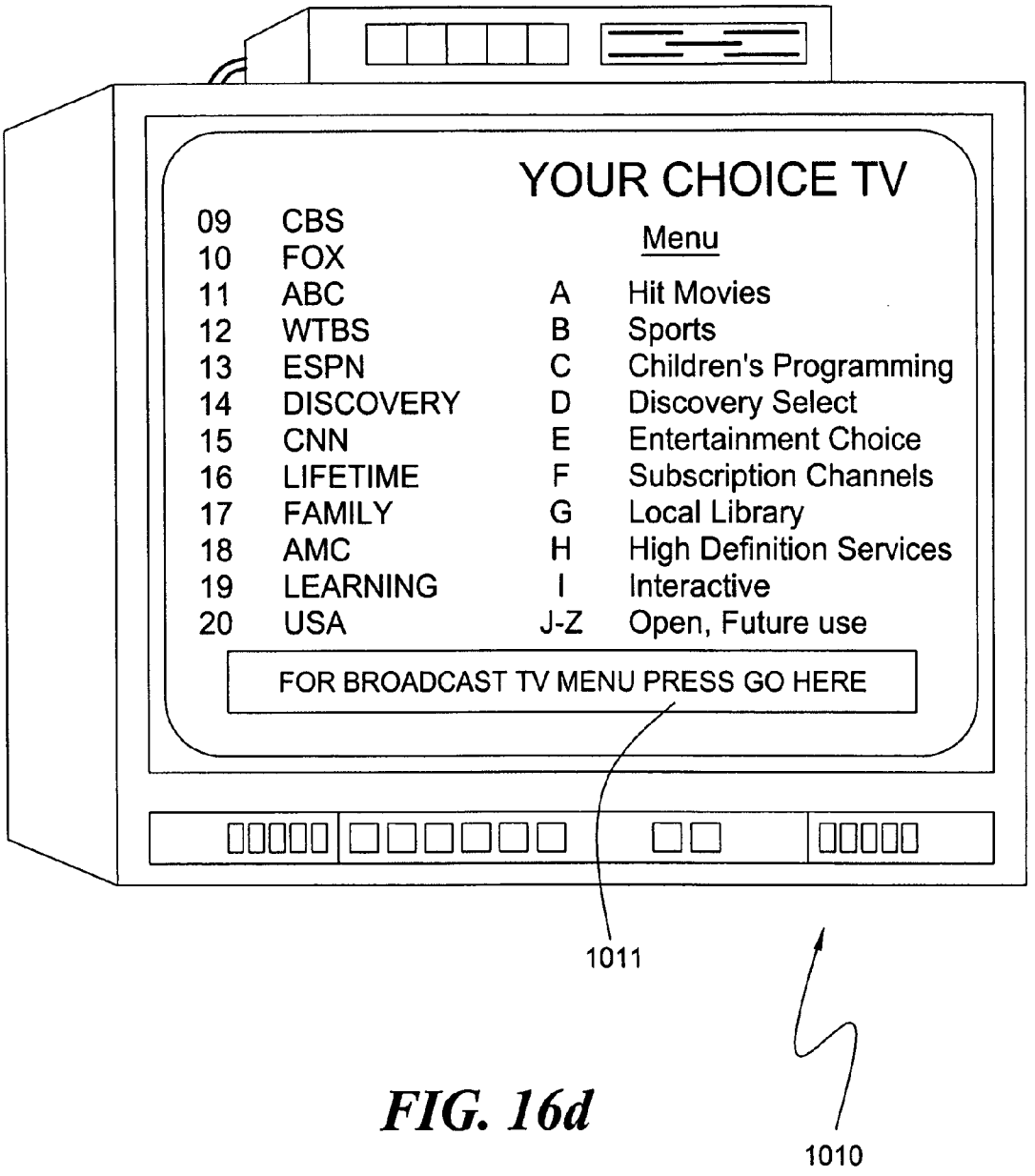
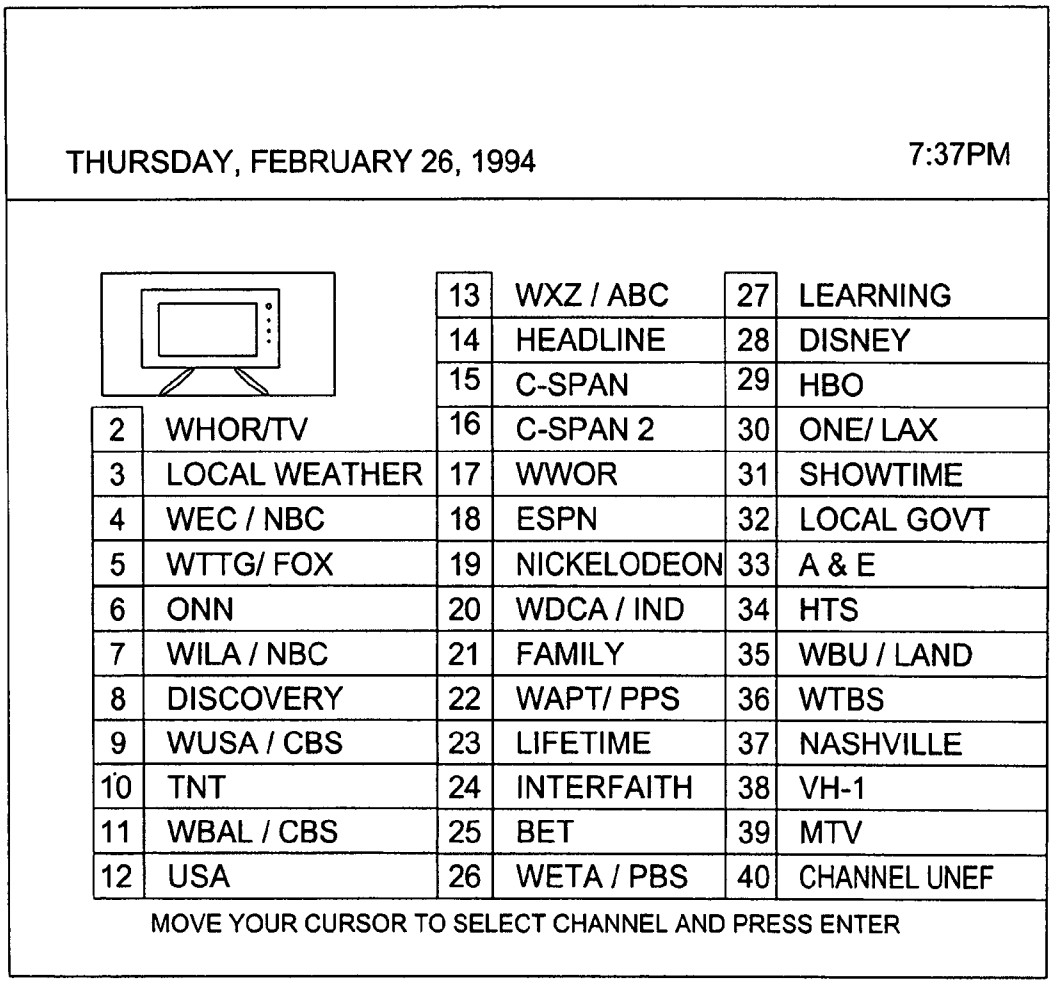

YOUR CHOICE TV
09 CBS
10 FOX
11 ABC
12 WTBS
13 ESPN
14 DISCOVERY
15 CNN
16 LIFETIME
17 FAMILY
18 AMC
19 LEARNING
20 USA
Menu
A Hit Movies
B Sports
C Children's Programming
D Discovery Select
E Entertainment Choice
F Subscription Channels
G Local Library
H High Definition Services
I Interactive
J-Z Open, Future use
FOR BROADCAST TV MENU PRESS GO HERE
1011
1010

FIG. 16d


THURSDAY, FEBRUARY 26, 1994
7:37PM
2 WHOR/TV
3 LOCAL WEATHER
4 WEC / NBC
5 WTTG/ FOX
6 ONN
7 WILA / NBC
8 DISCOVERY
9 WUSA / CBS
10 TNT
11 WBAL / CBS
12 USA
13 WXZ / ABC
14 HEADLINE
15 C-SPAN
16 C-SPAN 2
17 WWOR
18 ESPN
19 NICKELODEON
20 WDCA / IND
21 FAMILY
22 WAPT/ PPS
23 LIFETIME
24 INTERFAITH
25 BET
26 WETA / PBS
27 LEARNING
28 DISNEY
29 HBO
30 ONE/ LAX
31 SHOWTIME
32 LOCAL GOVT
33 A & E
34 HTS
35 WBU / LAND
36 WTBS
37 NASHVILLE
38 VH-1
39 MTV
40 CHANNEL UNEF
MOVE YOUR CURSOR TO SELECT CHANNEL AND PRESS ENTER

1010

FIG. 17

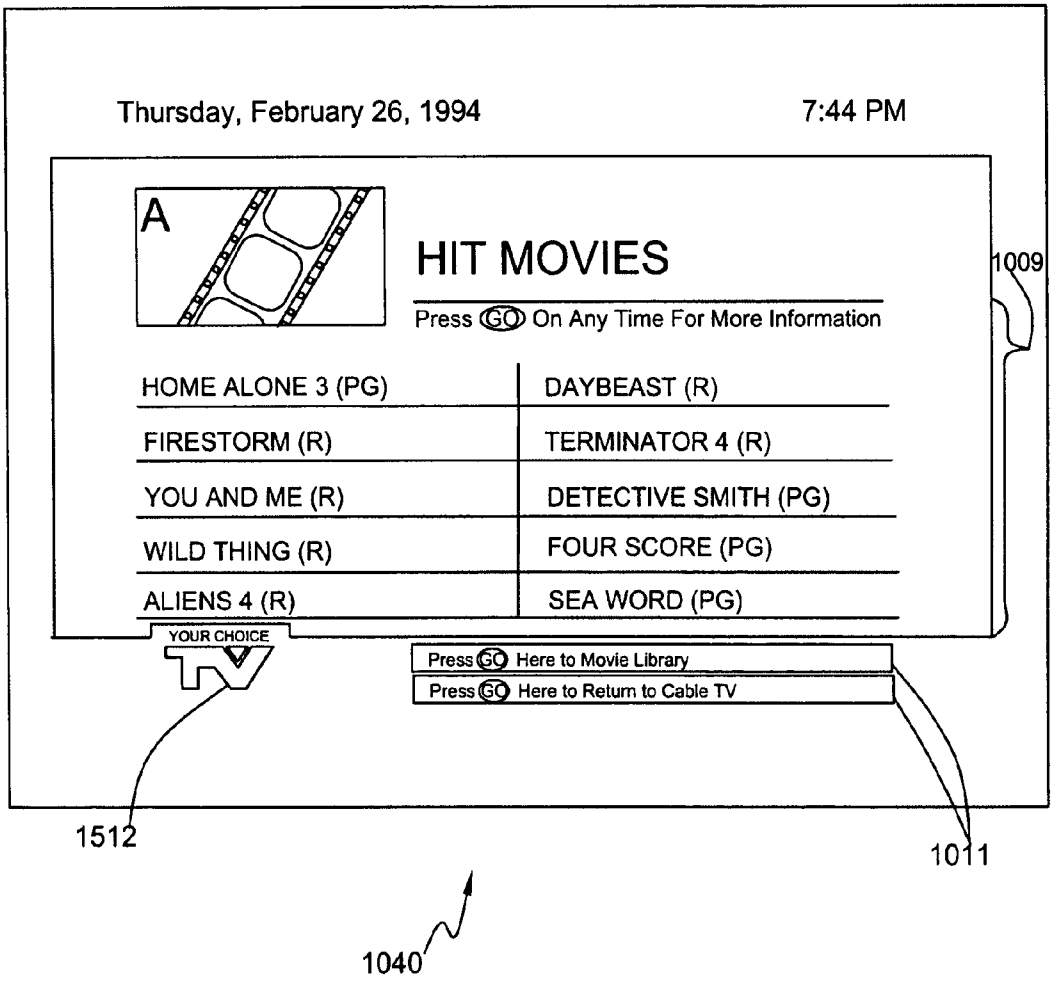
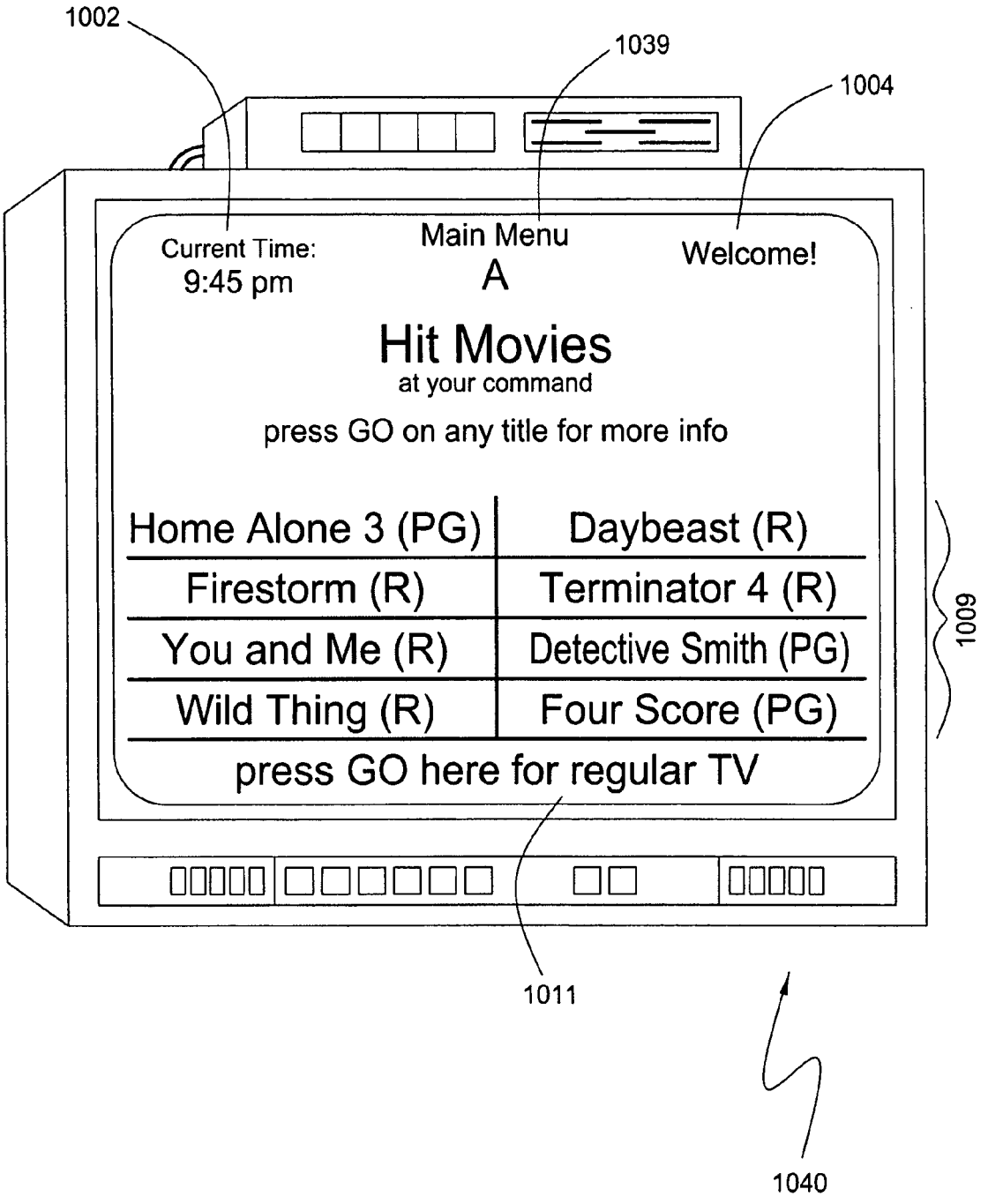

Thursday, February 26, 1994
7:44 PM
A
HIT MOVIES
Press GO On Any Time For More Information
1009
HOME ALONE 3 (PG)
DAYBEAST (R)
FIRESTORM (R)
TERMINATOR 4 (R)
YOU AND ME (R)
DETECTIVE SMITH (PG)
WILD THING (R)
FOUR SCORE (PG)
ALIENS 4 (R)
SEA WORD (PG)
YOUR CHOICE TV
Press GO Here to Movie Library
Press GO Here to Return to Cable TV
1512
1011
1040

FIG. 18a

FIG. 18b


1002
1039
1004
Current Time:
9:45 pm
Main Menu
A
Welcome!
Hit Movies
at your command
press GO on any title for more info
Home Alone 3 (PG)
Daybeast (R)
Firestorm (R)
Terminator 4 (R)
You and Me (R)
Detective Smith (PG)
Wild Thing (R)
Four Score (PG)
press GO here for regular TV
1009
1011
1040

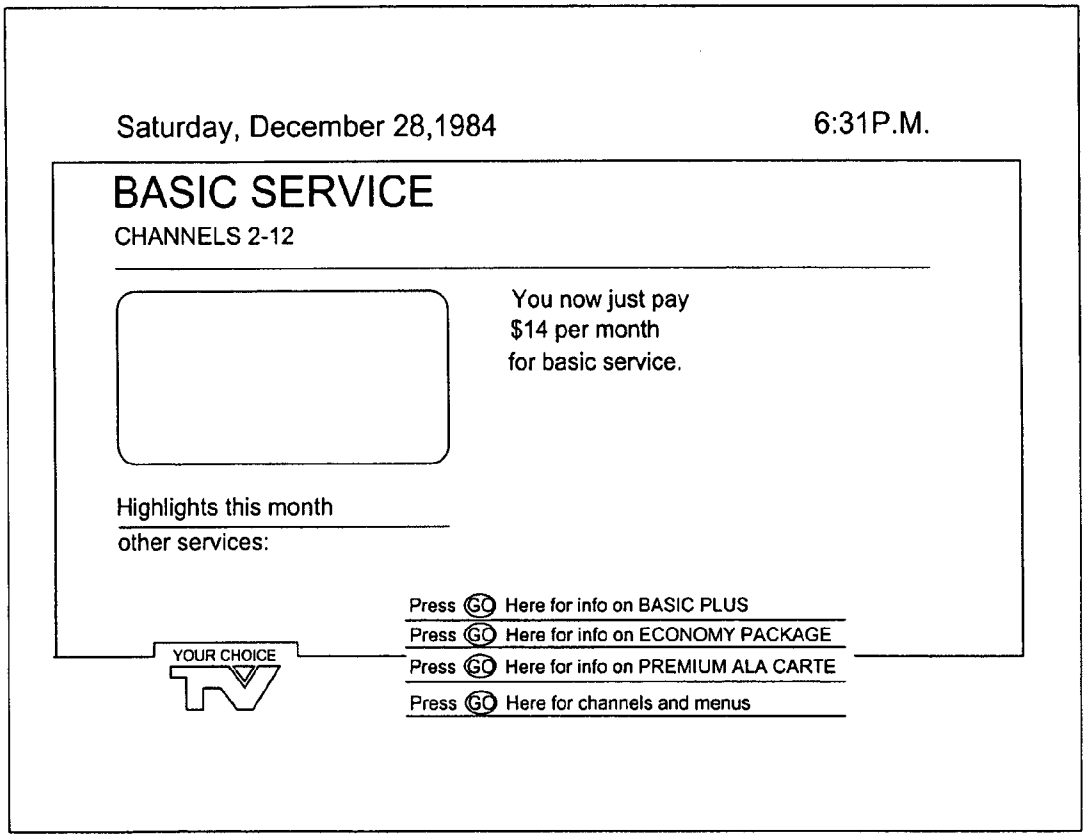

Saturday, December 28,1984
6:31P.M.
BASIC SERVICE
CHANNELS 2-12
You now just pay
$14 per month
for basic service.
Highlights this month
other services:
YOUR CHOICE
TV
Press GO Here for info on BASIC PLUS
Press GO Here for info on ECONOMY PACKAGE
Press GO Here for info on PREMIUM ALA CARTE
Press GO Here for channels and menus
1420

FIG. 18c

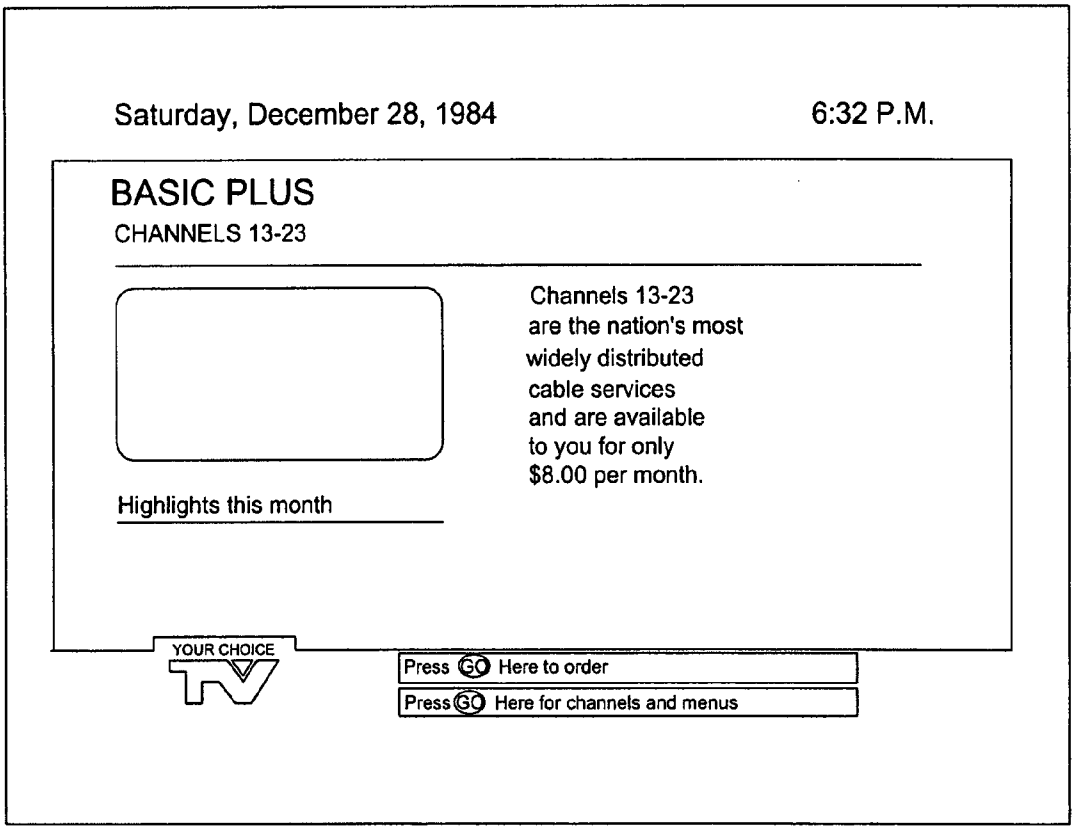

Saturday, December 28, 1984
6:32 P.M.
BASIC PLUS
CHANNELS 13-23
Channels 13-23
are the nation's most
widely distributed
cable services
and are available
to you for only
$8.00 per month.
Highlights this month
YOUR CHOICE TV
Press GO Here to order
Press GO Here for channels and menus
1422

FIG. 18d

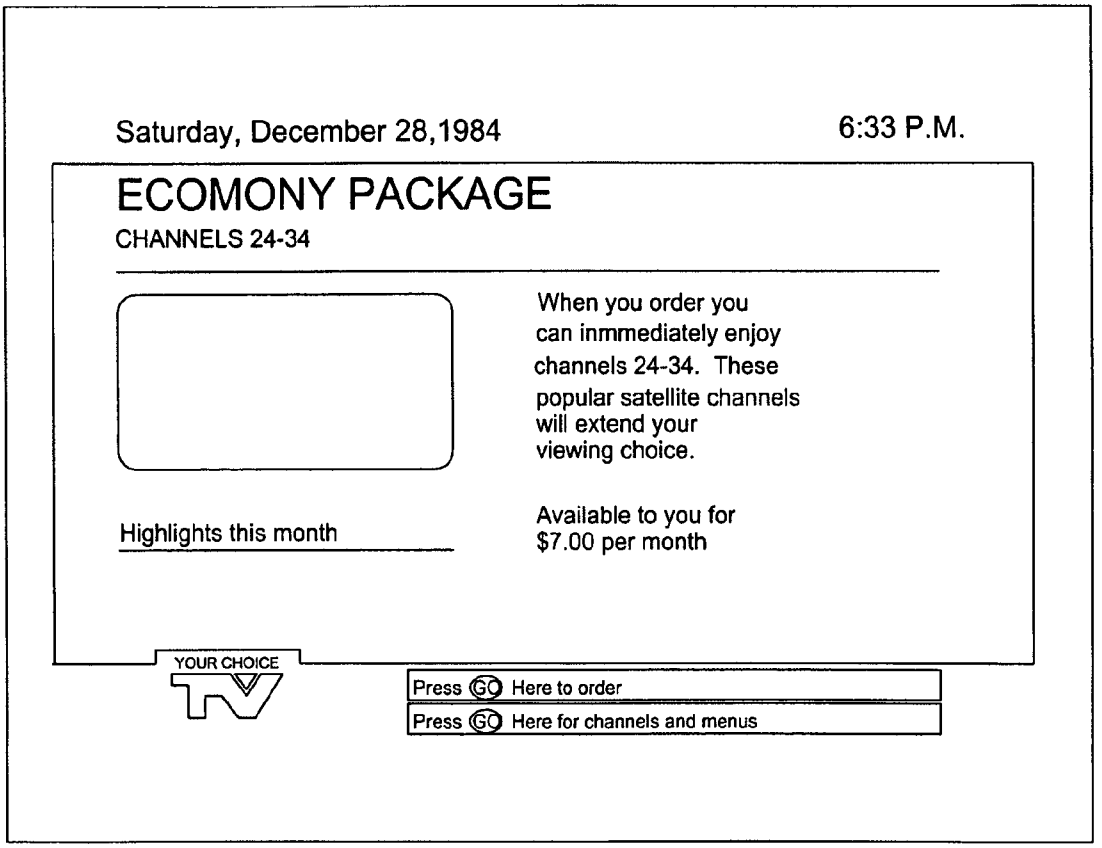

Saturday, December 28,1984
6:33 P.M.
ECOMONY PACKAGE
CHANNELS 24-34
When you order you can inmmediately enjoy channels 24-34. These popular satellite channels will extend your viewing choice.
Highlights this month
Available to you for $7.00 per month
YOUR CHOICE TV
Press GO Here to order
Press GO Here for channels and menus
1424

FIG. 18e

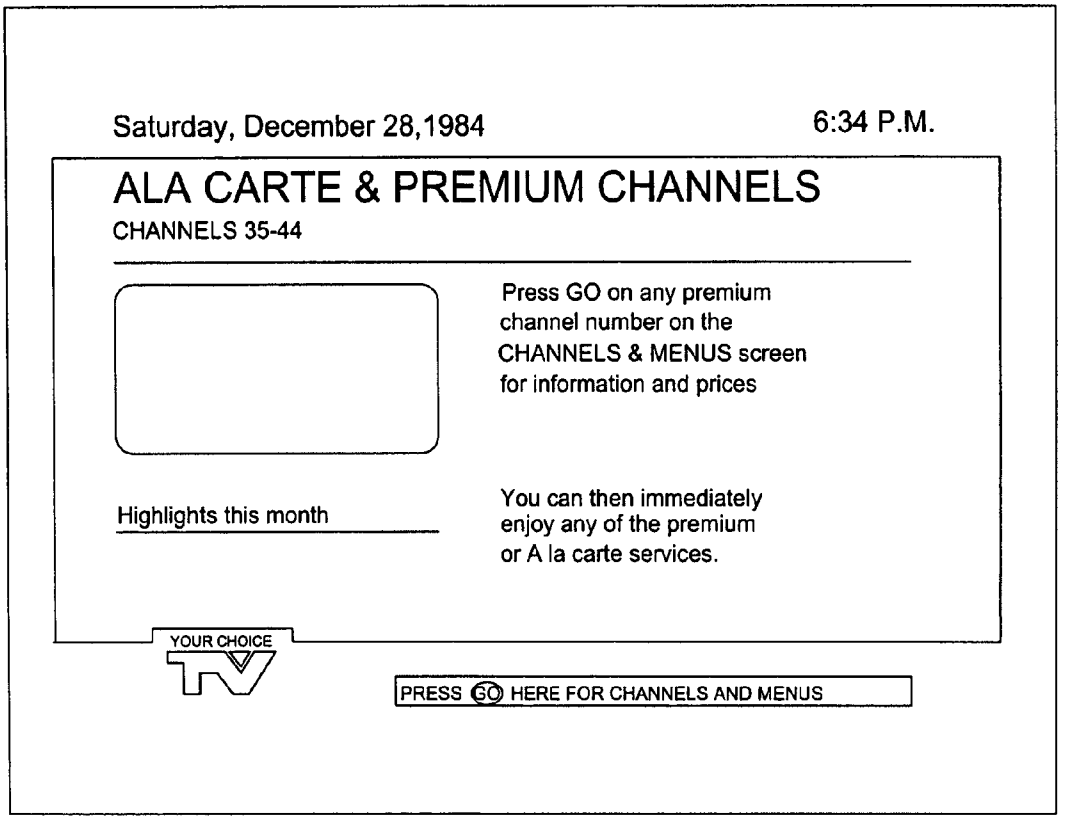

Saturday, December 28,1984
6:34 P.M.
ALA CARTE & PREMIUM CHANNELS
CHANNELS 35-44
Press GO on any premium channel number on the CHANNELS & MENUS screen for information and prices
Highlights this month
You can then immediately enjoy any of the premium or A la carte services.
YOUR CHOICE TV
PRESS GO HERE FOR CHANNELS AND MENUS
1426

FIG. 18f

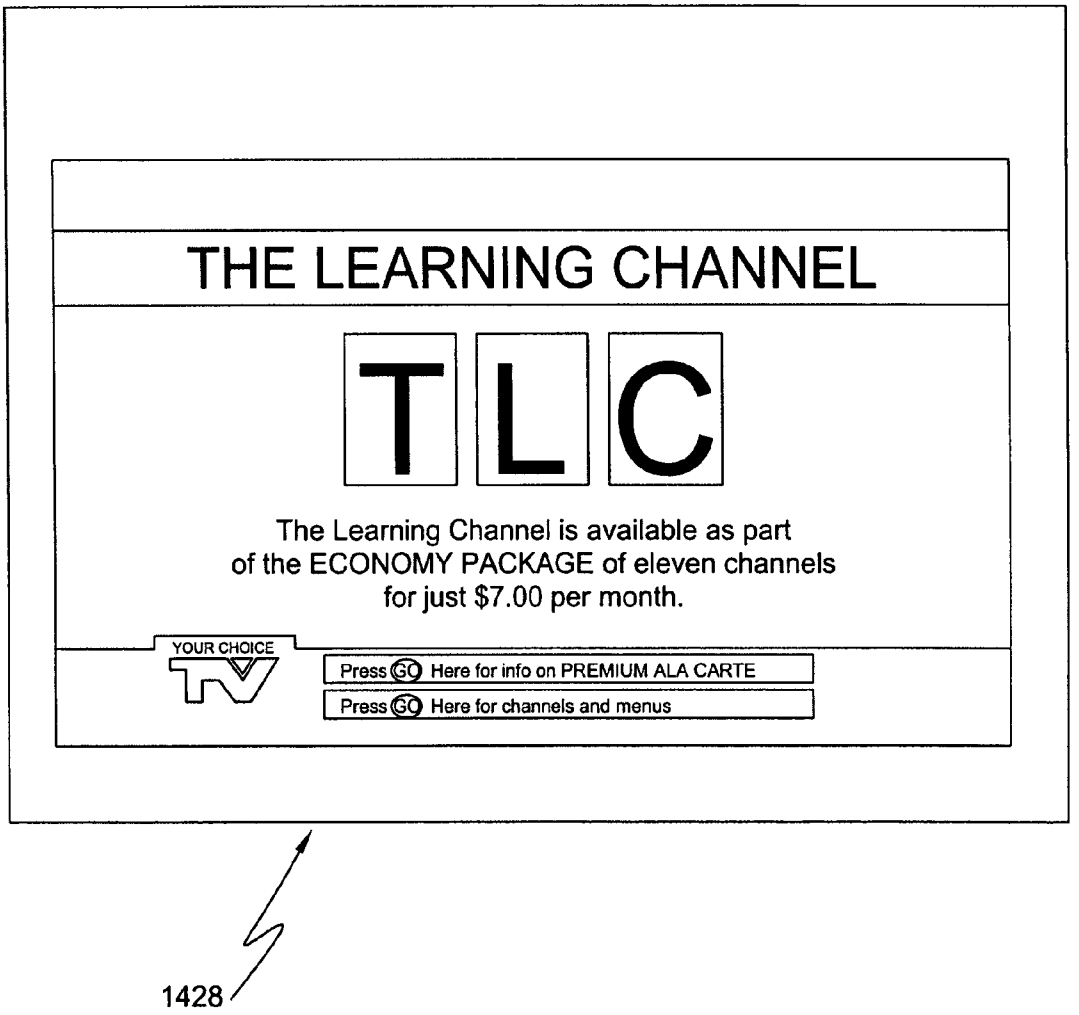

THE LEARNING CHANNEL
T L C
The Learning Channel is available as part
of the ECONOMY PACKAGE of eleven channels
for just $7.00 per month.
YOUR CHOICE TV
Press GO Here for info on PREMIUM ALA CARTE
Press GO Here for channels and menus
1428

FIG. 18g

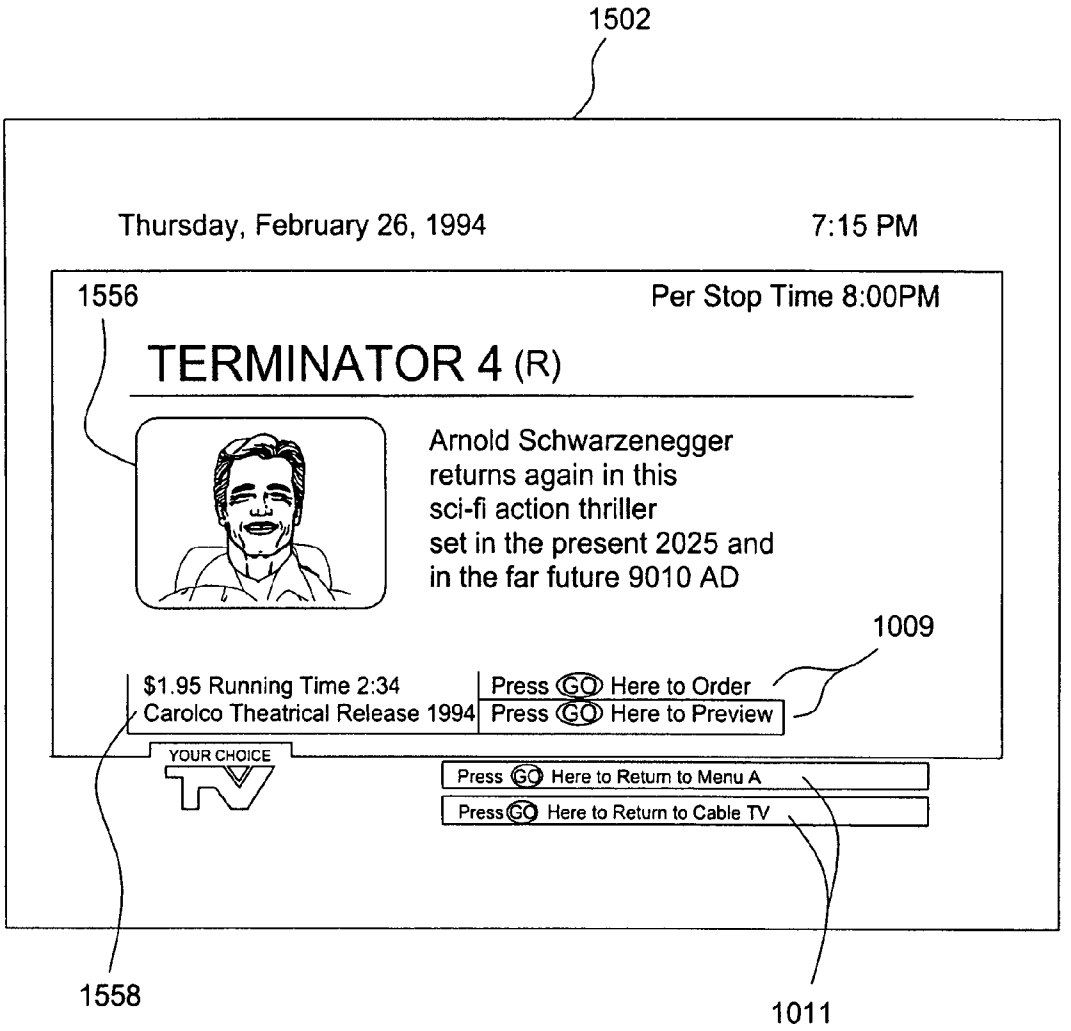
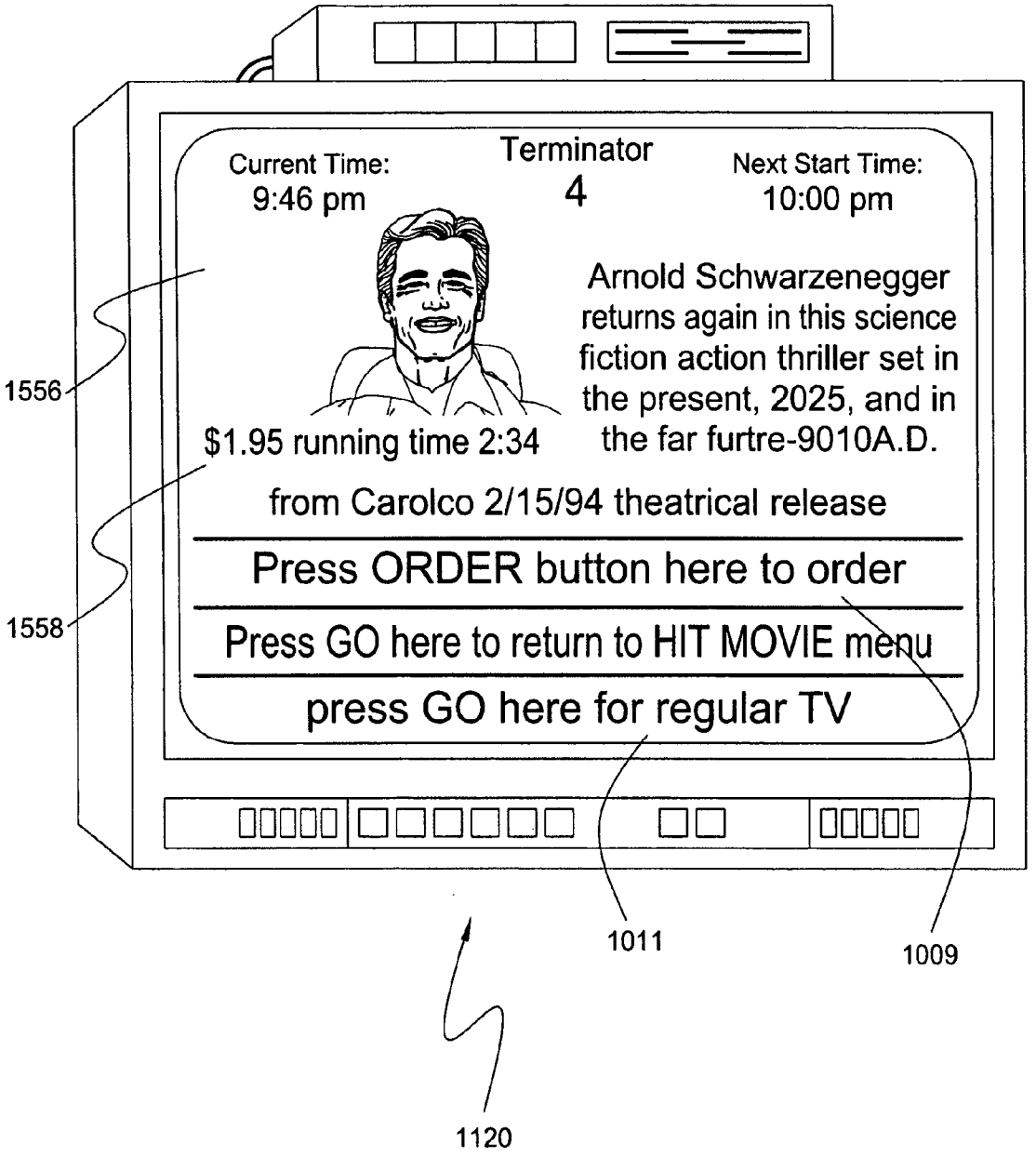

1502
Thursday, February 26, 1994
7:15 PM
1556
Per Stop Time 8:00PM
TERMINATOR 4 (R)
Arnold Schwarzenegger
returns again in this
sci-fi action thriller
set in the present 2025 and
in the far future 9010 AD
1009
$1.95 Running Time 2:34
Carolco Theatrical Release 1994
Press GO Here to Order
Press GO Here to Preview
YOUR CHOICE TV
Press GO Here to Return to Menu A
Press GO Here to Return to Cable TV
1558
1011
1120

FIG. 19a

FIG. 19b


Current Time:
9:46 pm
Terminator
4
Next Start Time:
10:00 pm
Arnold Schwarzenegger returns again in this science fiction action thriller set in the present, 2025, and in the far furtre-9010A.D.
$1.95 running time 2:34
from Carolco 2/15/94 theatrical release
Press ORDER button here to order
Press GO here to return to HIT MOVIE menu
press GO here for regular TV
1556
1558
1011
1009
1120

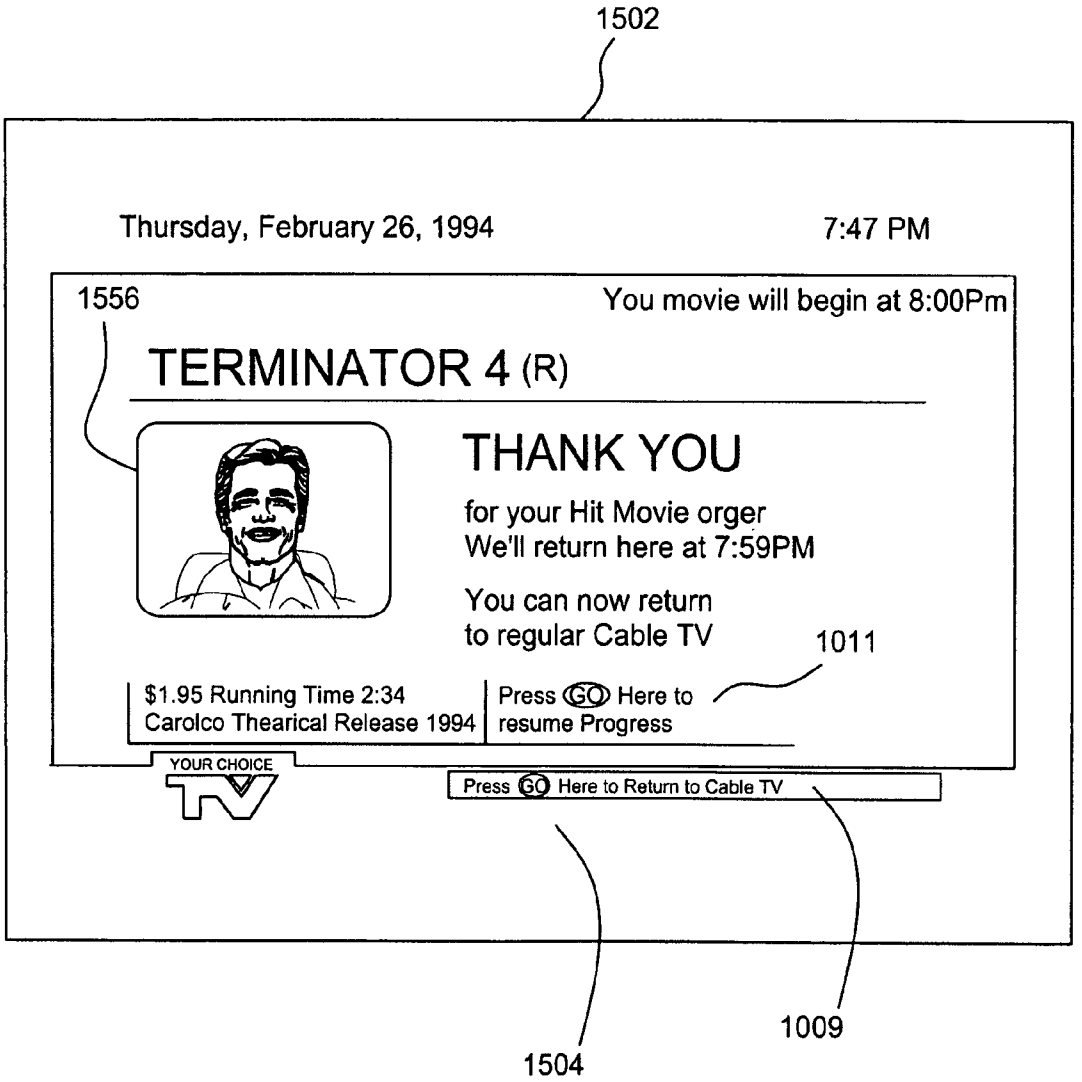

1502
Thursday, February 26, 1994
7:47 PM
1556
You movie will begin at 8:00Pm
TERMINATOR 4 (R)
THANK YOU
for your Hit Movie orger
We'll return here at 7:59PM
You can now return
to regular Cable TV
1011
$1.95 Running Time 2:34
Carolco Thearical Release 1994
Press GO Here to
resume Progress
YOUR CHOICE
TV
Press GO Here to Return to Cable TV
1504
1009
1125

FIG. 20a

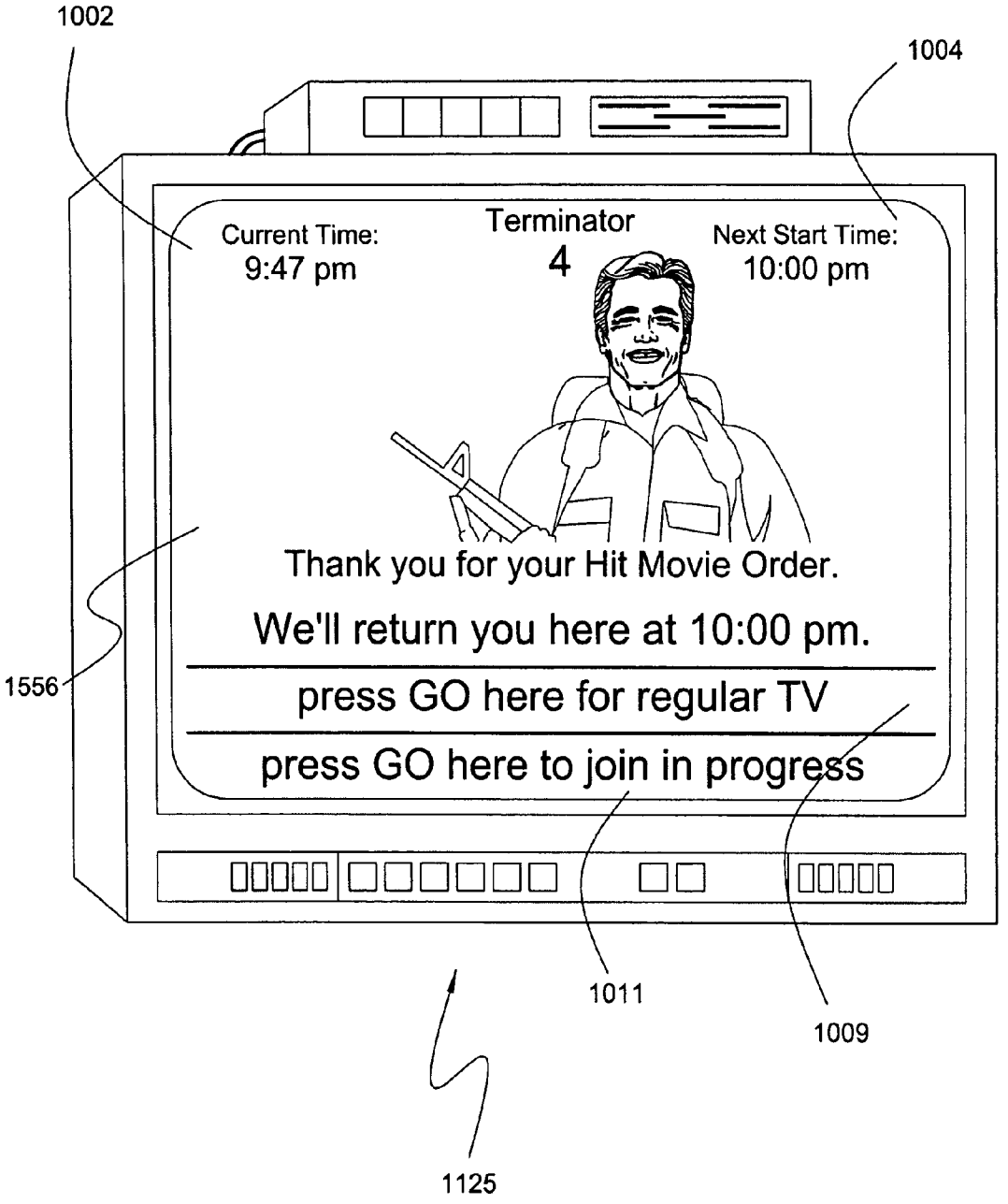
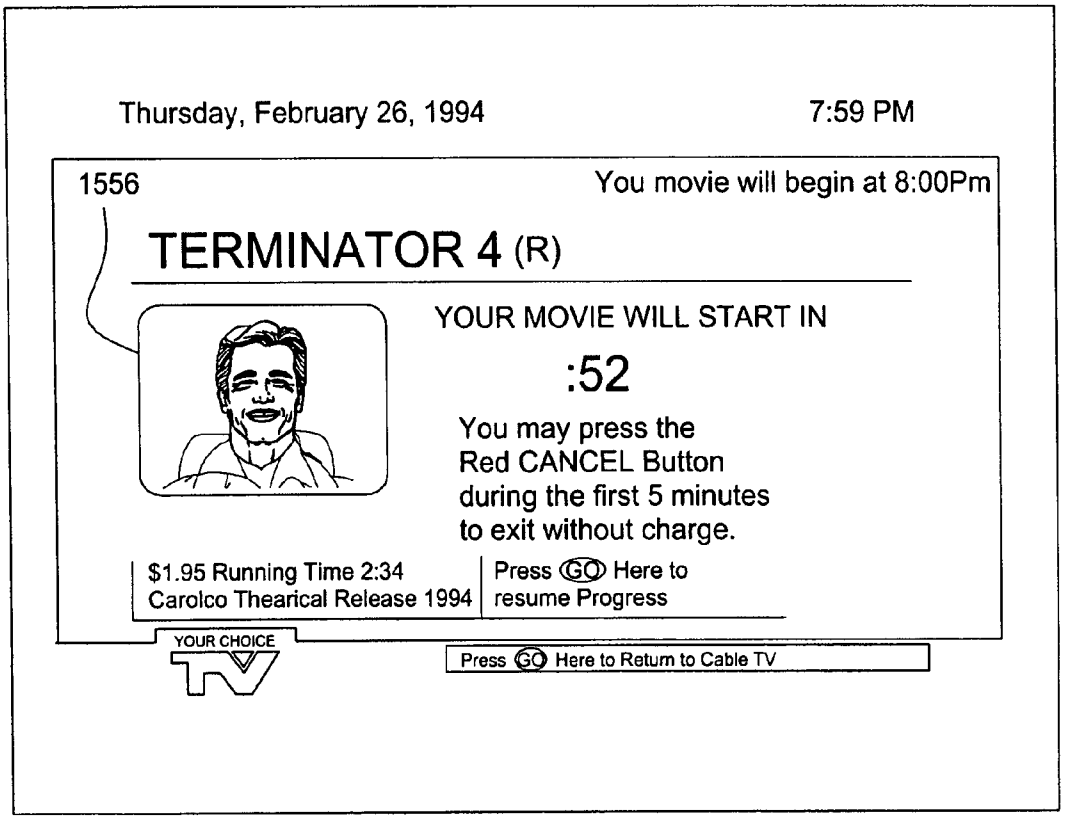

1002
1004
Current Time:
9:47 pm
Terminator
4
Next Start Time:
10:00 pm
Thank you for your Hit Movie Order.
We'll return you here at 10:00 pm.
press GO here for regular TV
press GO here to join in progress
1556
1011
1009
1125

FIG. 20b


Thursday, February 26, 1994
7:59 PM
1556
You movie will begin at 8:00Pm
TERMINATOR 4 (R)
YOUR MOVIE WILL START IN
:52
You may press the
Red CANCEL Button
during the first 5 minutes
to exit without charge.
$1.95 Running Time 2:34
Carolco Thearical Release 1994
Press GO Here to
resume Progress
YOUR CHOICE TV
Press GO Here to Return to Cable TV

1127

FIG. 21a

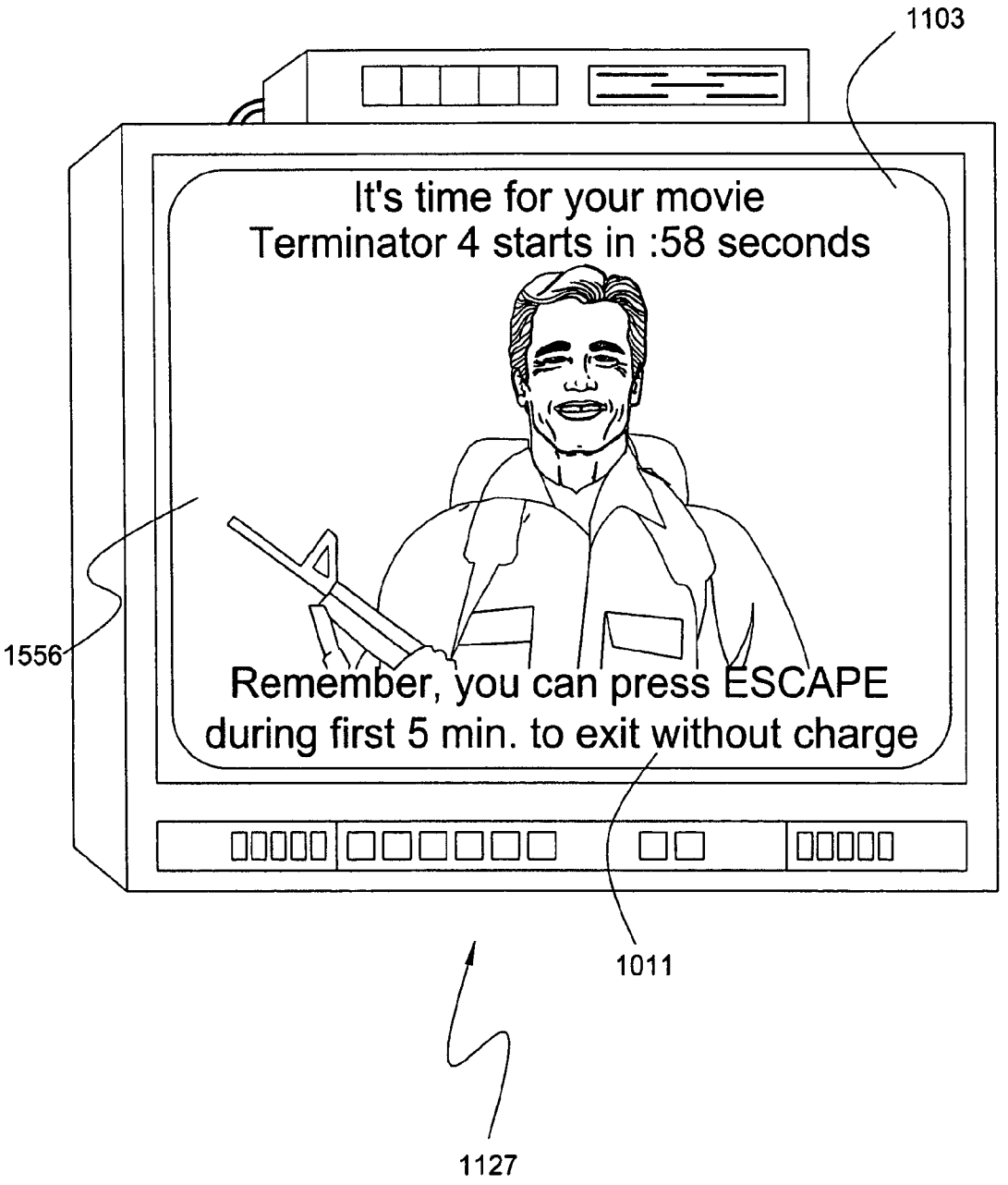

1103
It's time for your movie
Terminator 4 starts in :58 seconds
1556
Remember, you can press ESCAPE
during first 5 min. to exit without charge
1011
1127

FIG. 21b

Fig. 22a

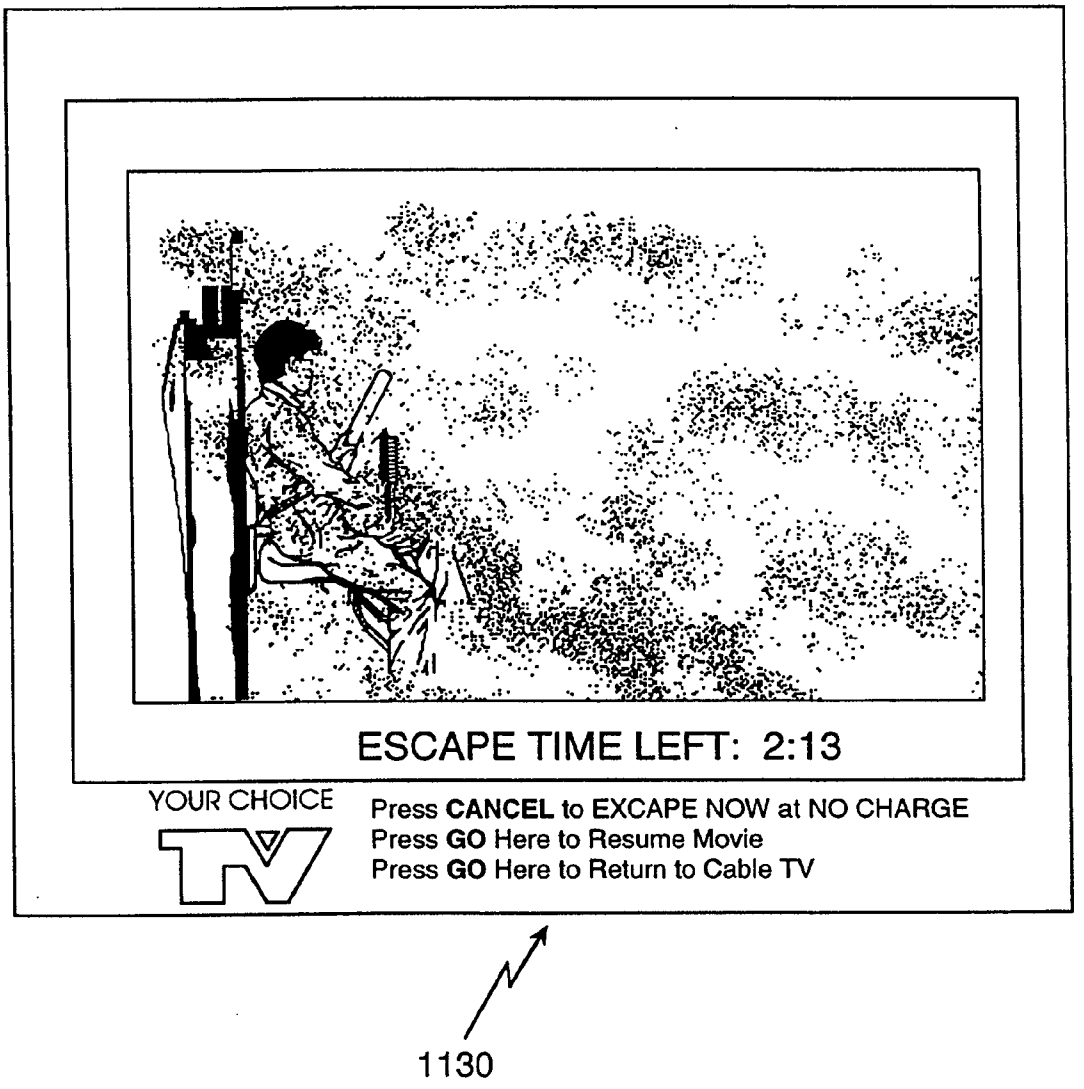

ESCAPE TIME LEFT: 2:13
YOUR CHOICE
TV
Press CANCEL to EXCAPE NOW at NO CHARGE
Press GO Here to Resume Movie
Press GO Here to Return to Cable TV
1130

Fig. 22b

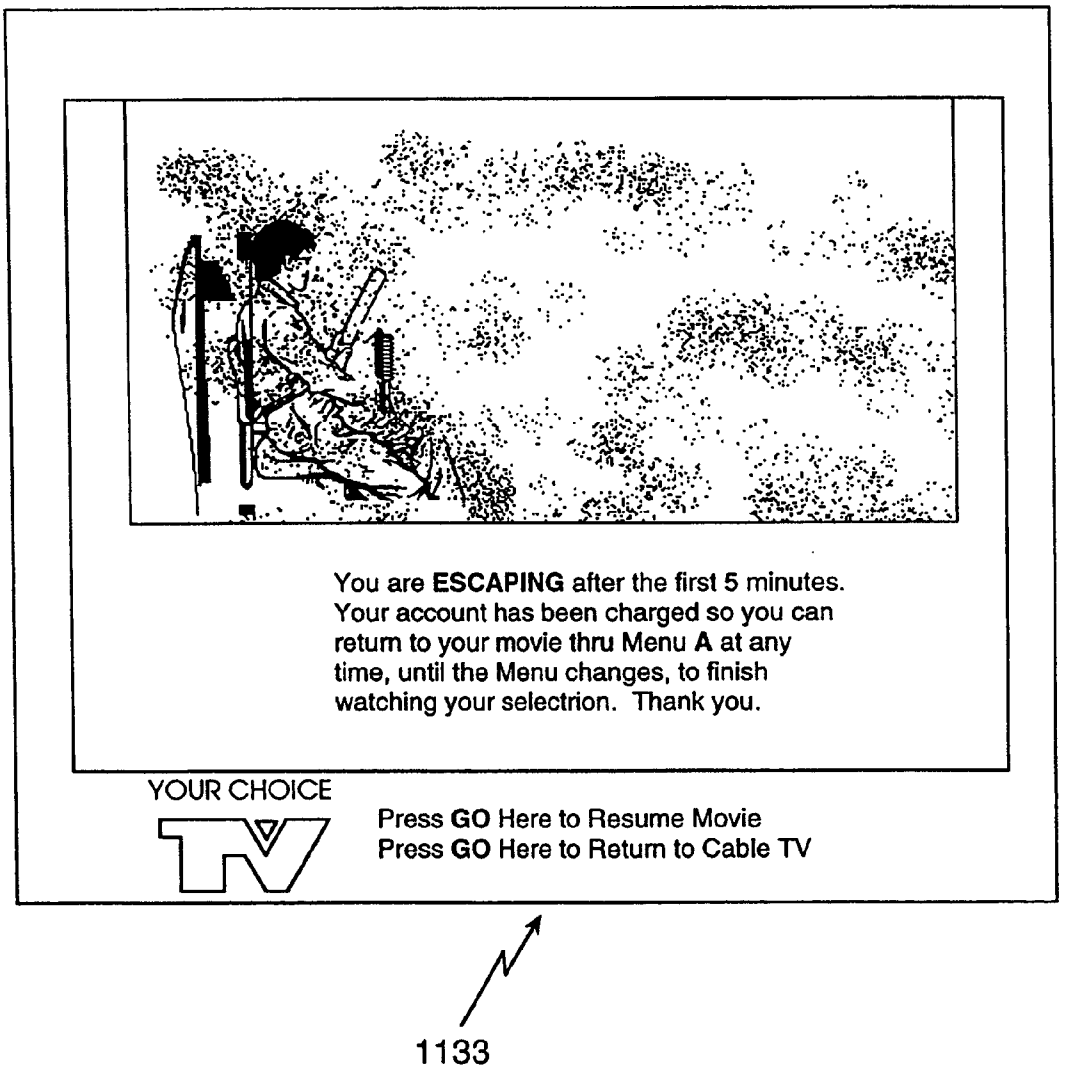
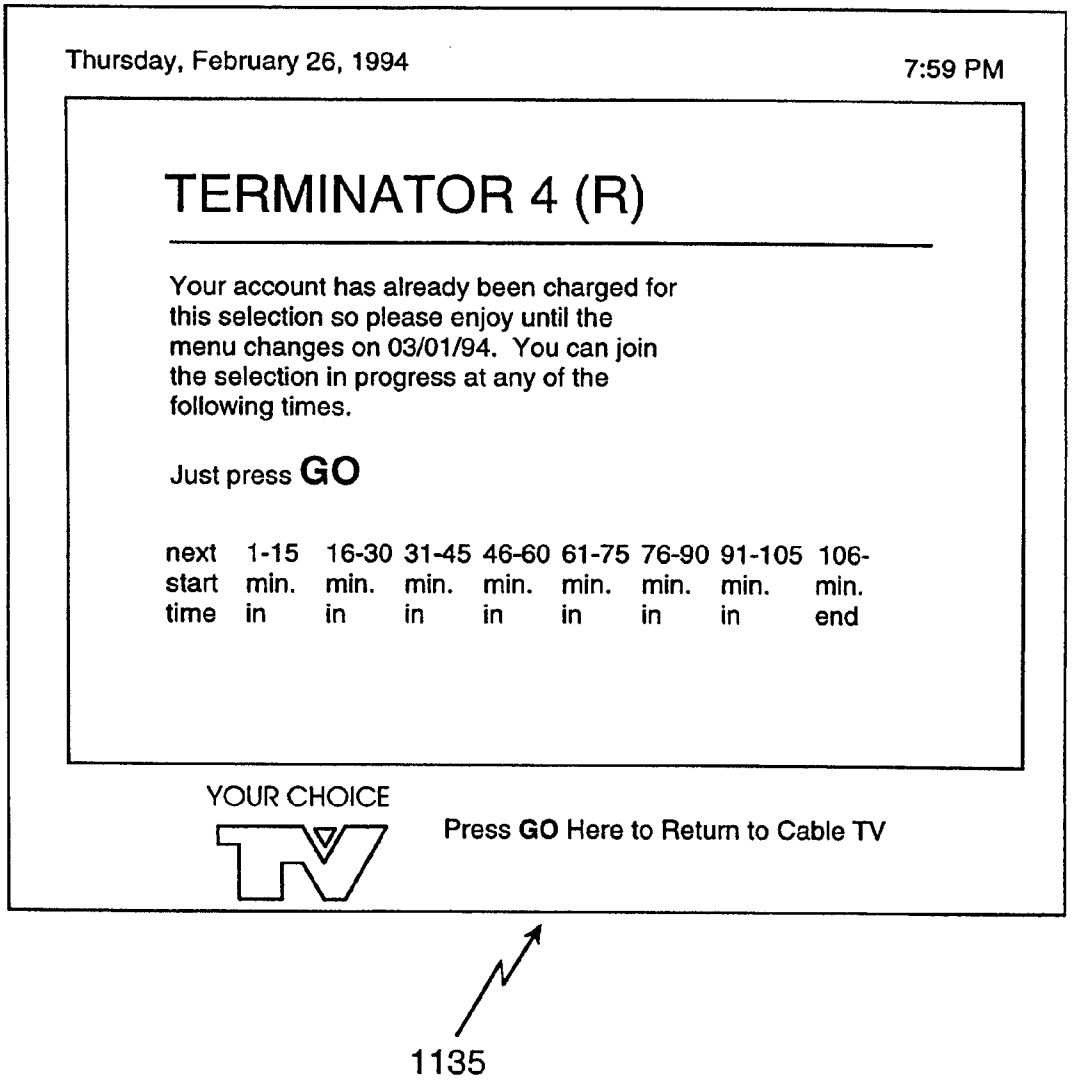

You are **ESCAPING** after the first 5 minutes. Your account has been charged so you can return to your movie thru Menu **A** at any time, until the Menu changes, to finish watching your selectrion. Thank you.
YOUR CHOICE
TV
Press **GO** Here to Resume Movie
Press **GO** Here to Return to Cable TV
1133

Fig. 22c


Thursday, February 26, 1994
7:59 PM
TERMINATOR 4 (R)
Your account has already been charged for this selection so please enjoy until the menu changes on 03/01/94. You can join the selection in progress at any of the following times.
Just press GO
next start time
1-15 min. in
16-30 min. in
31-45 min. in
46-60 min. in
61-75 min. in
76-90 min. in
91-105 min. in
106- min. end
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1135

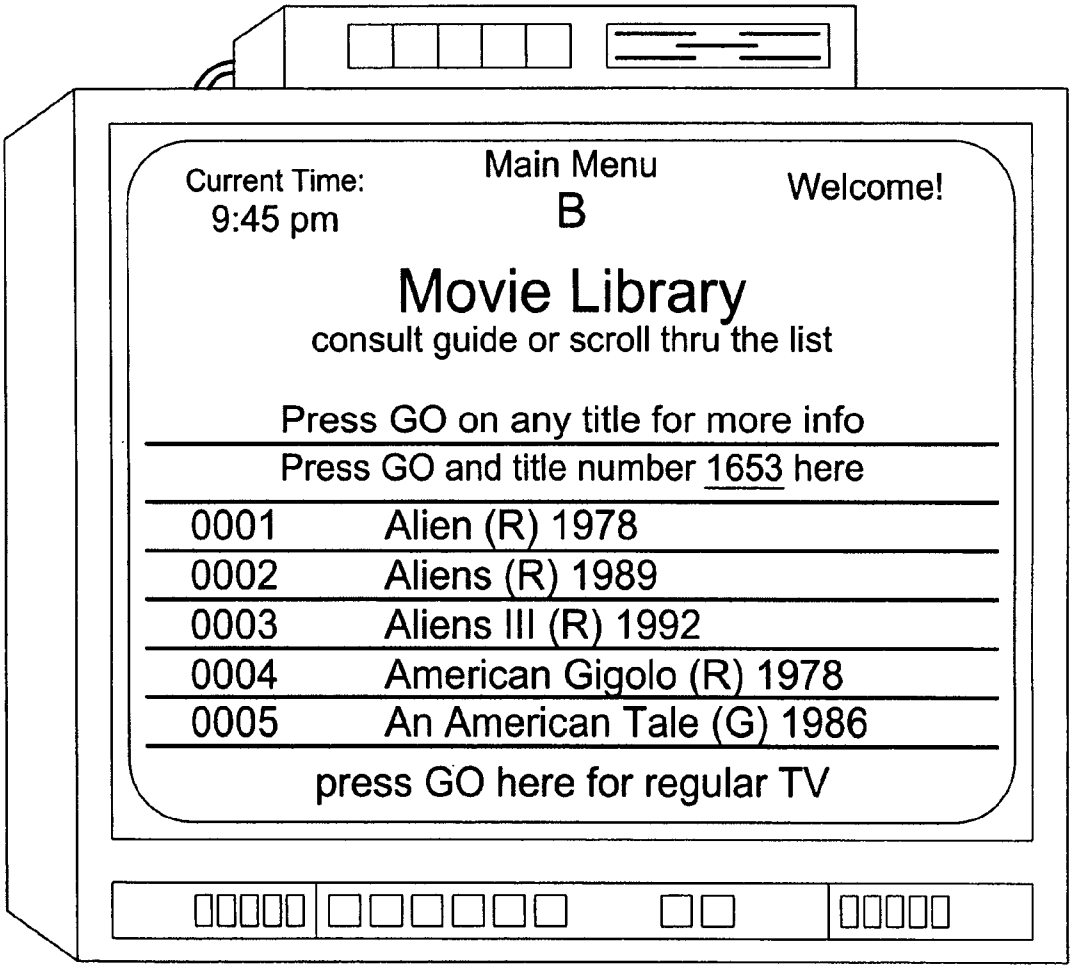
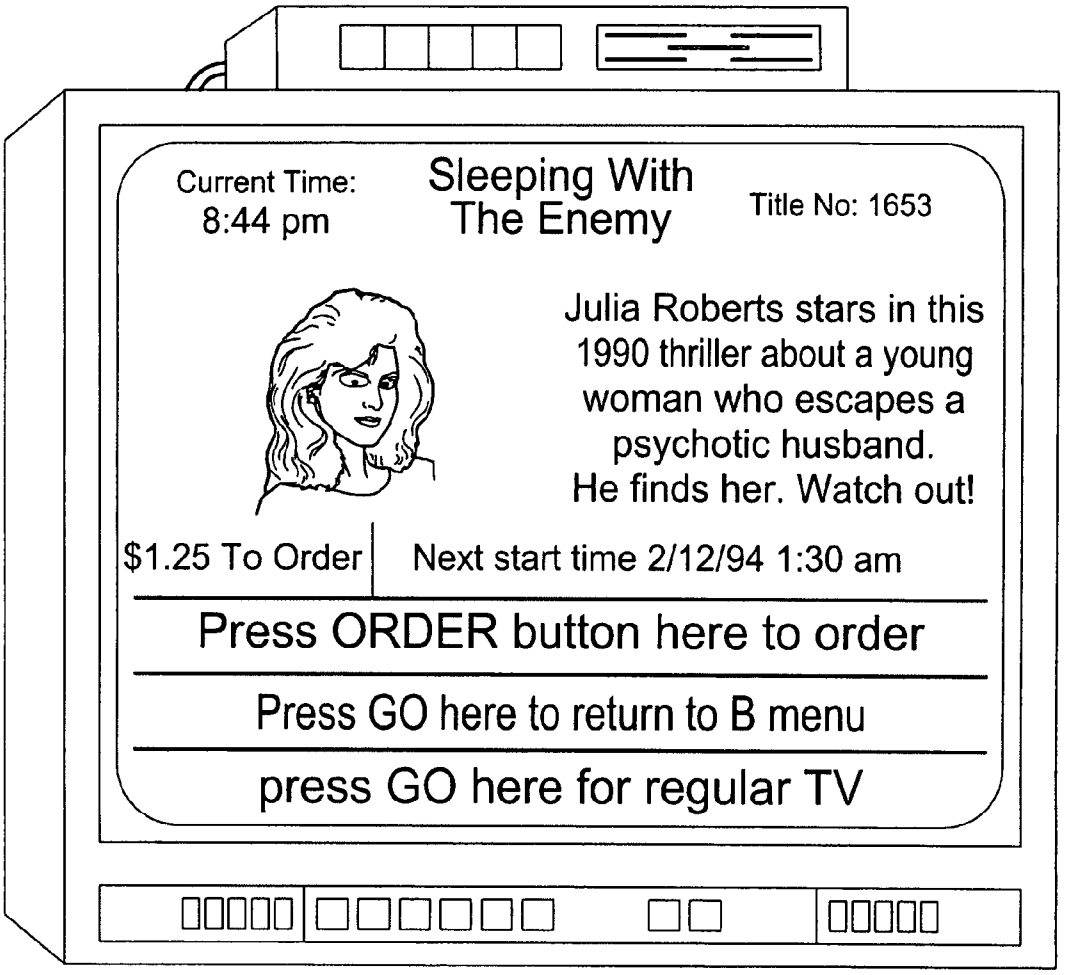

Current Time:
9:45 pm
Main Menu
B
Welcome!
Movie Library
consult guide or scroll thru the list
Press GO on any title for more info
Press GO and title number 1653 here
0001 Alien (R) 1978
0002 Aliens (R) 1989
0003 Aliens III (R) 1992
0004 American Gigolo (R) 1978
0005 An American Tale (G) 1986
press GO here for regular TV
1148

FIG. 23


Current Time:
8:44 pm
Sleeping With
The Enemy
Title No: 1653
Julia Roberts stars in this
1990 thriller about a young
woman who escapes a
psychotic husband.
He finds her. Watch out!
$1.25 To Order
Next start time 2/12/94 1:30 am
Press ORDER button here to order
Press GO here to return to B menu
press GO here for regular TV

1140

FIG. 24

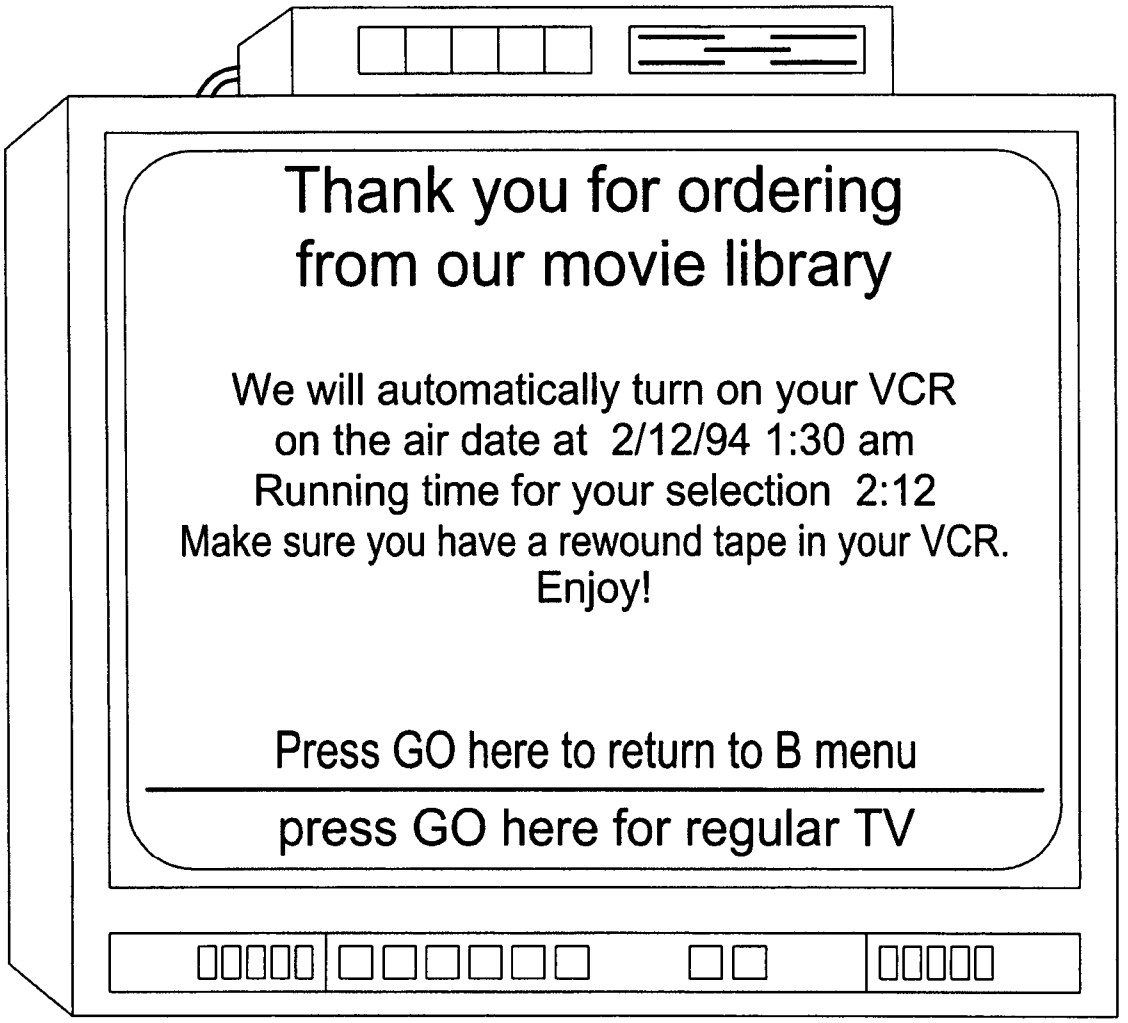
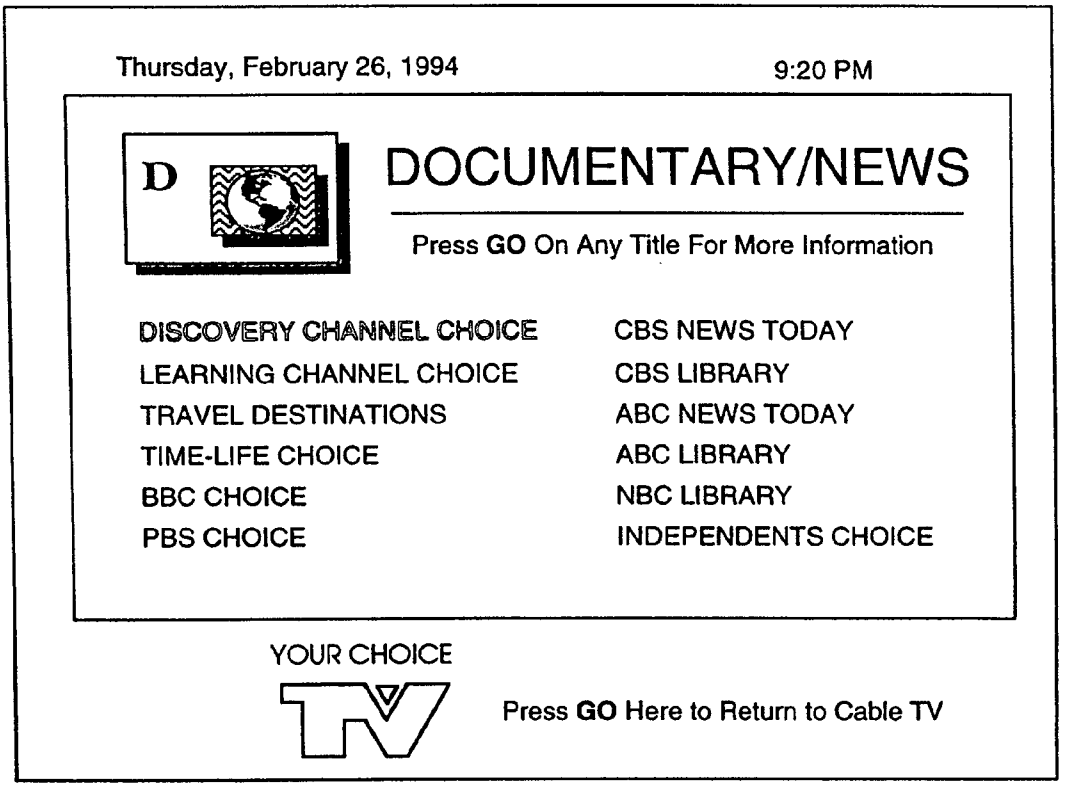

Thank you for ordering
from our movie library
We will automatically turn on your VCR
on the air date at 2/12/94 1:30 am
Running time for your selection 2:12
Make sure you have a rewound tape in your VCR.
Enjoy!
Press GO here to return to B menu
press GO here for regular TV
1142

FIG. 25

Fig. 26a


Thursday, February 26, 1994
9:20 PM
D
DOCUMENTARY/NEWS
Press GO On Any Title For More Information
DISCOVERY CHANNEL CHOICE
LEARNING CHANNEL CHOICE
TRAVEL DESTINATIONS
TIME-LIFE CHOICE
BBC CHOICE
PBS CHOICE
CBS NEWS TODAY
CBS LIBRARY
ABC NEWS TODAY
ABC LIBRARY
NBC LIBRARY
INDEPENDENTS CHOICE
YOUR CHOICE
TV
Press GO Here to Return to Cable TV

1028

Fig. 26b

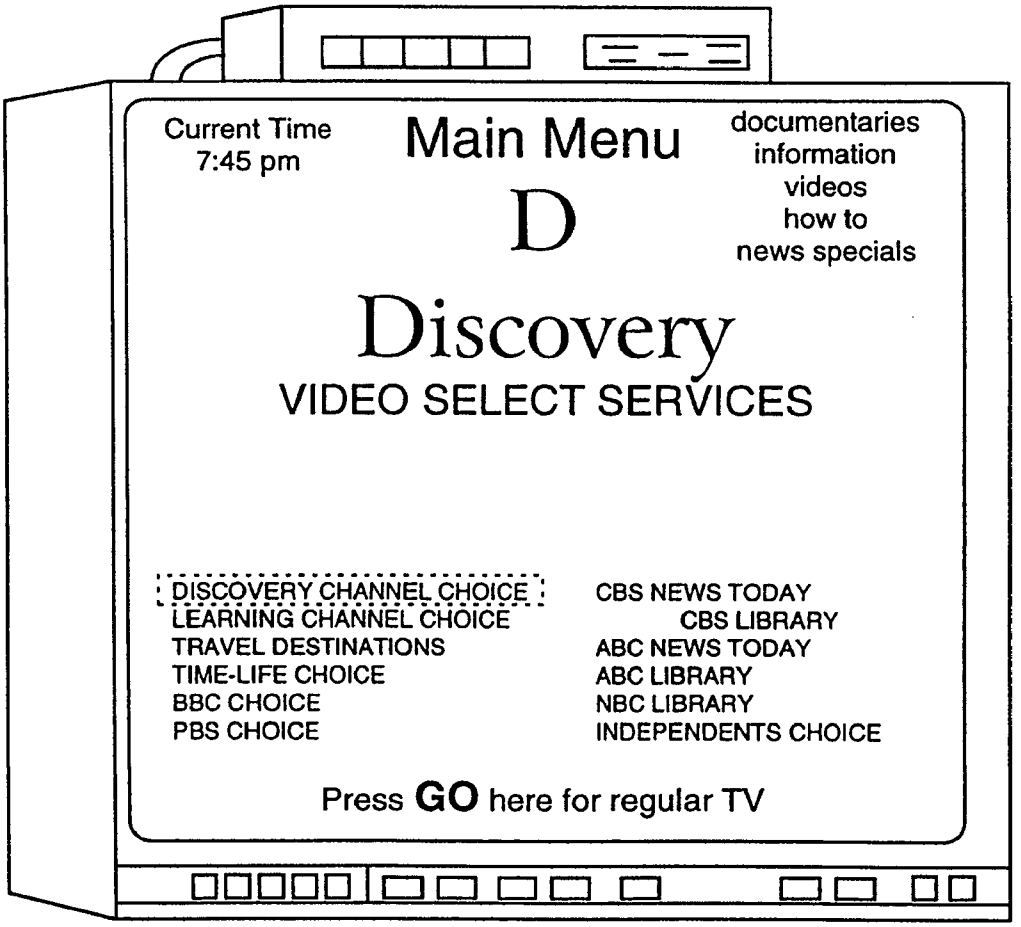
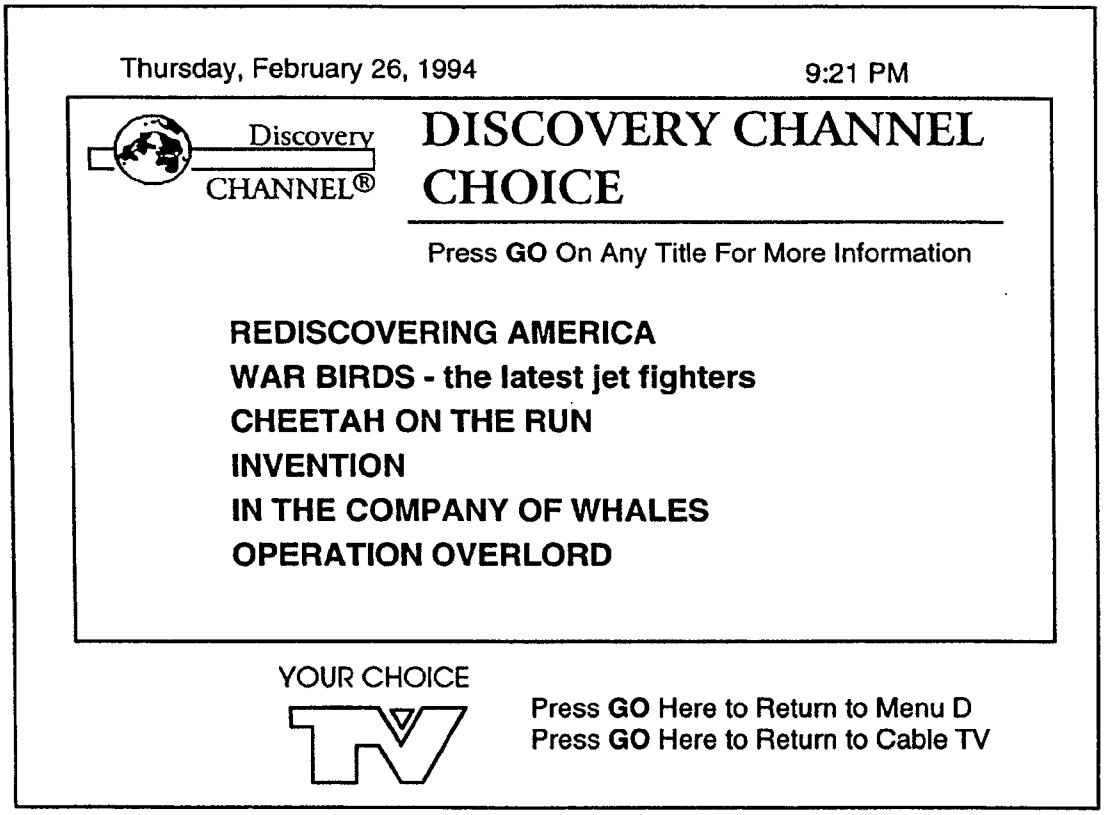
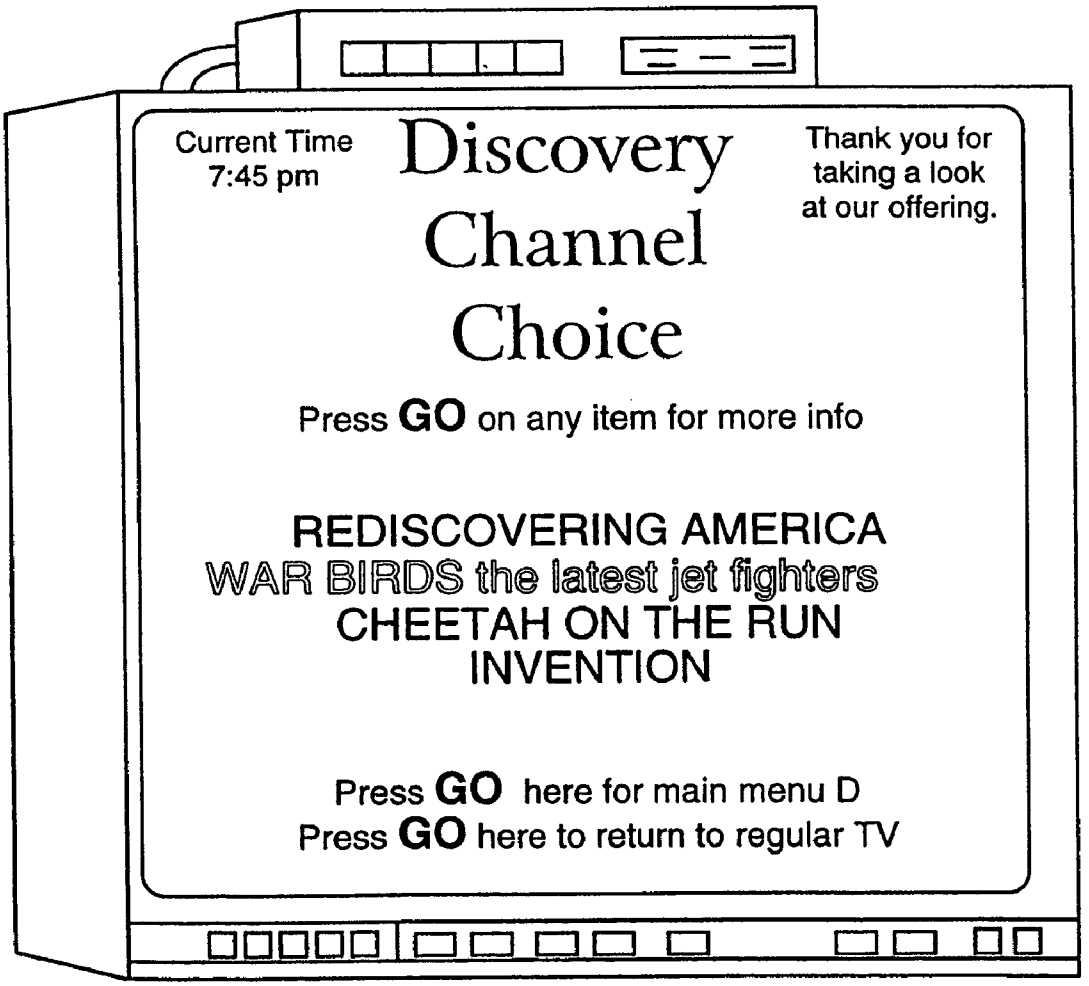

Current Time
7:45 pm
Main Menu
D
documentaries
information
videos
how to
news specials
Discovery
VIDEO SELECT SERVICES
DISCOVERY CHANNEL CHOICE
LEARNING CHANNEL CHOICE
TRAVEL DESTINATIONS
TIME-LIFE CHOICE
BBC CHOICE
PBS CHOICE
CBS NEWS TODAY
CBS LIBRARY
ABC NEWS TODAY
ABC LIBRARY
NBC LIBRARY
INDEPENDENTS CHOICE
Press GO here for regular TV
1042

Fig. 27a


Thursday, February 26, 1994
9:21 PM
Discovery CHANNEL®
DISCOVERY CHANNEL CHOICE
Press GO On Any Title For More Information
REDISCOVERING AMERICA
WAR BIRDS - the latest jet fighters
CHEETAH ON THE RUN
INVENTION
IN THE COMPANY OF WHALES
OPERATION OVERLORD
YOUR CHOICE
TV
Press GO Here to Return to Menu D
Press GO Here to Return to Cable TV

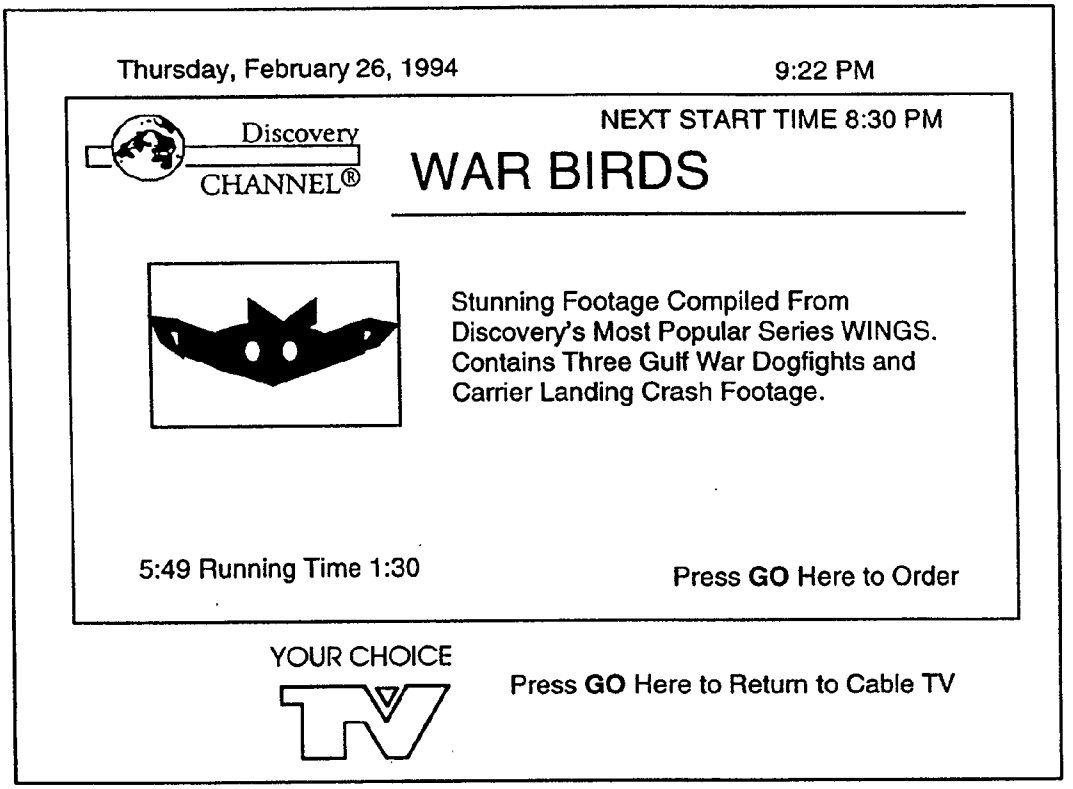
1148

Fig. 27b


Current Time
7:45 pm
Discovery
Channel
Choice
Thank you for
taking a look
at our offering.
Press GO on any item for more info
REDISCOVERING AMERICA
WAR BIRDS the latest jet fighters
CHEETAH ON THE RUN
INVENTION
Press GO here for main menu D
Press GO here to return to regular TV

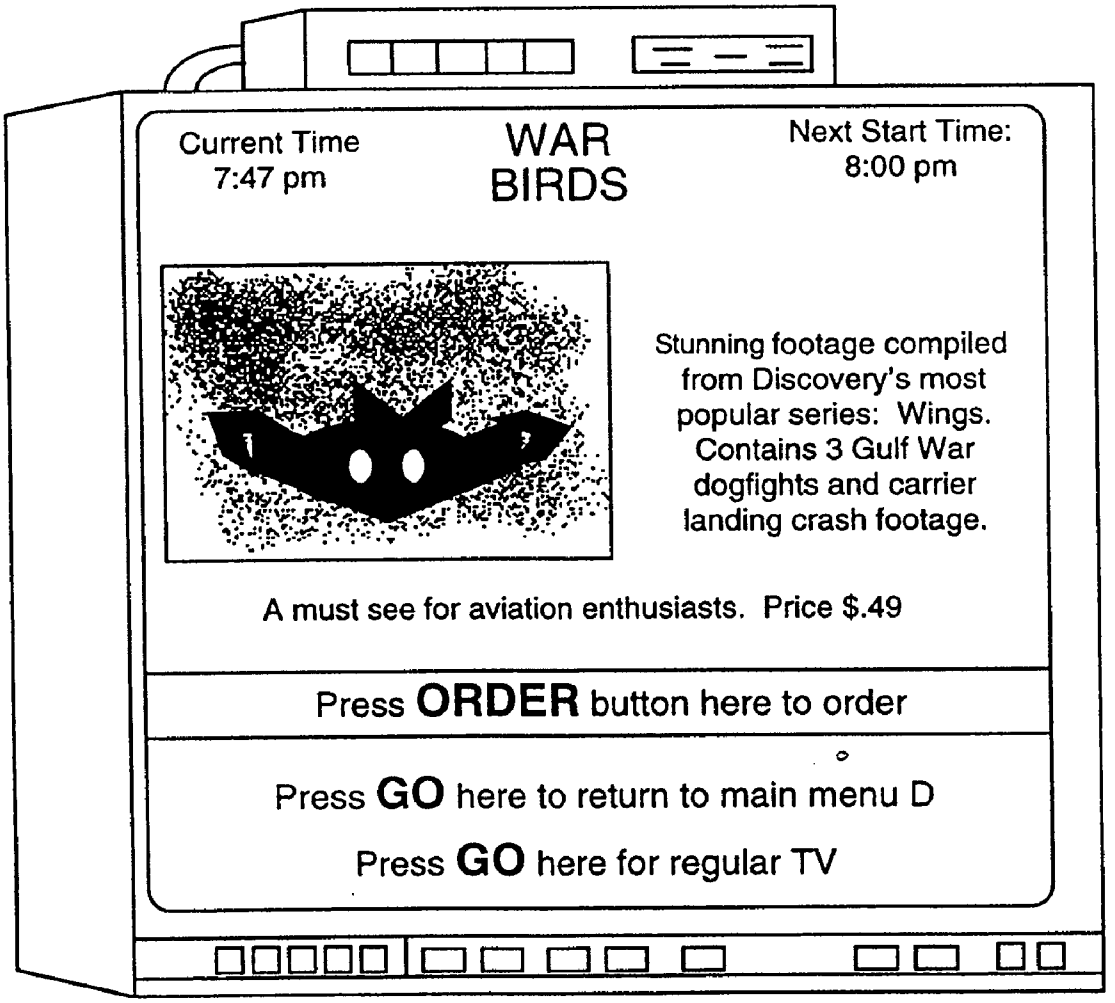
1148

Fig. 28a


Thursday, February 26, 1994
9:22 PM
Discovery
CHANNEL®
NEXT START TIME 8:30 PM
WAR BIRDS
Stunning Footage Compiled From
Discovery's Most Popular Series WINGS.
Contains Three Gulf War Dogfights and
Carrier Landing Crash Footage.
5:49 Running Time 1:30
Press GO Here to Order
YOUR CHOICE
TV
Press GO Here to Return to Cable TV

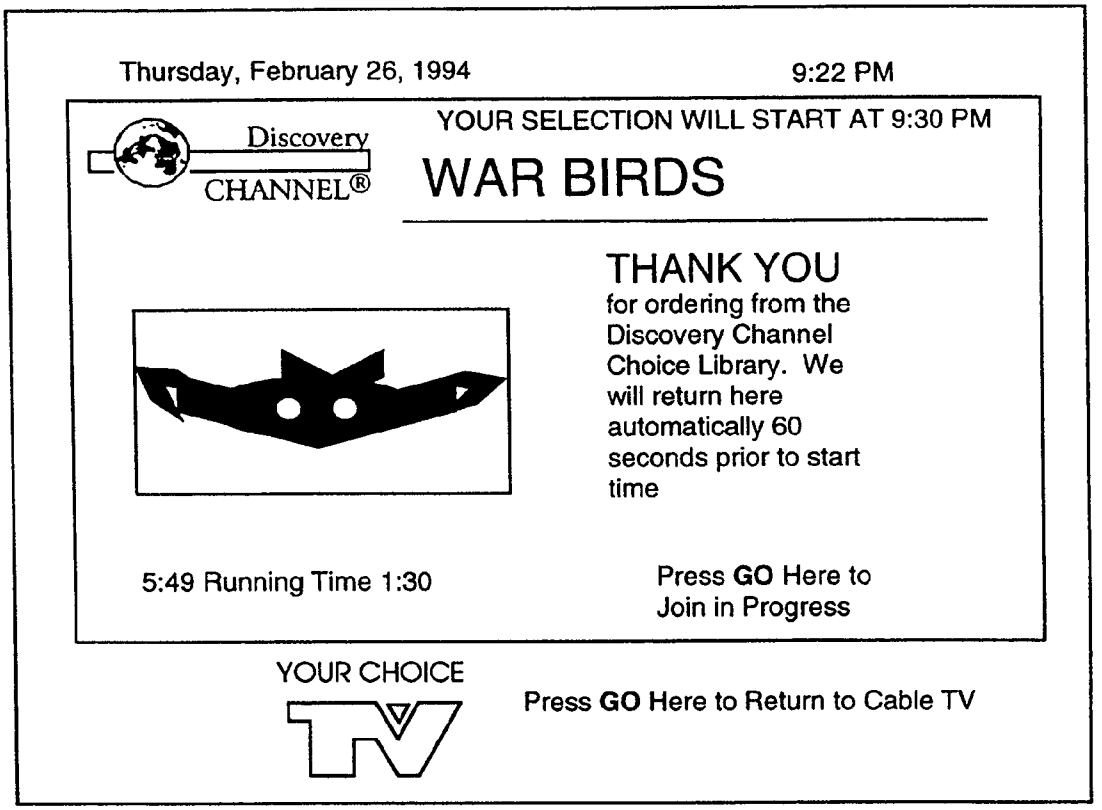
1152

Fig. 28b


Current Time
7:47 pm
WAR
BIRDS
Next Start Time:
8:00 pm
Stunning footage compiled from Discovery's most popular series: Wings. Contains 3 Gulf War dogfights and carrier landing crash footage.
A must see for aviation enthusiasts. Price $.49
Press ORDER button here to order
Press GO here to return to main menu D
Press GO here for regular TV

1152

Fig. 29A


Thursday, February 26, 1994
9:22 PM
Discovery
CHANNEL®
YOUR SELECTION WILL START AT 9:30 PM
WAR BIRDS
THANK YOU
for ordering from the Discovery Channel Choice Library. We will return here automatically 60 seconds prior to start time
5:49 Running Time 1:30
Press GO Here to Join in Progress
YOUR CHOICE
TV
Press GO Here to Return to Cable TV

1154

Fig. 29b

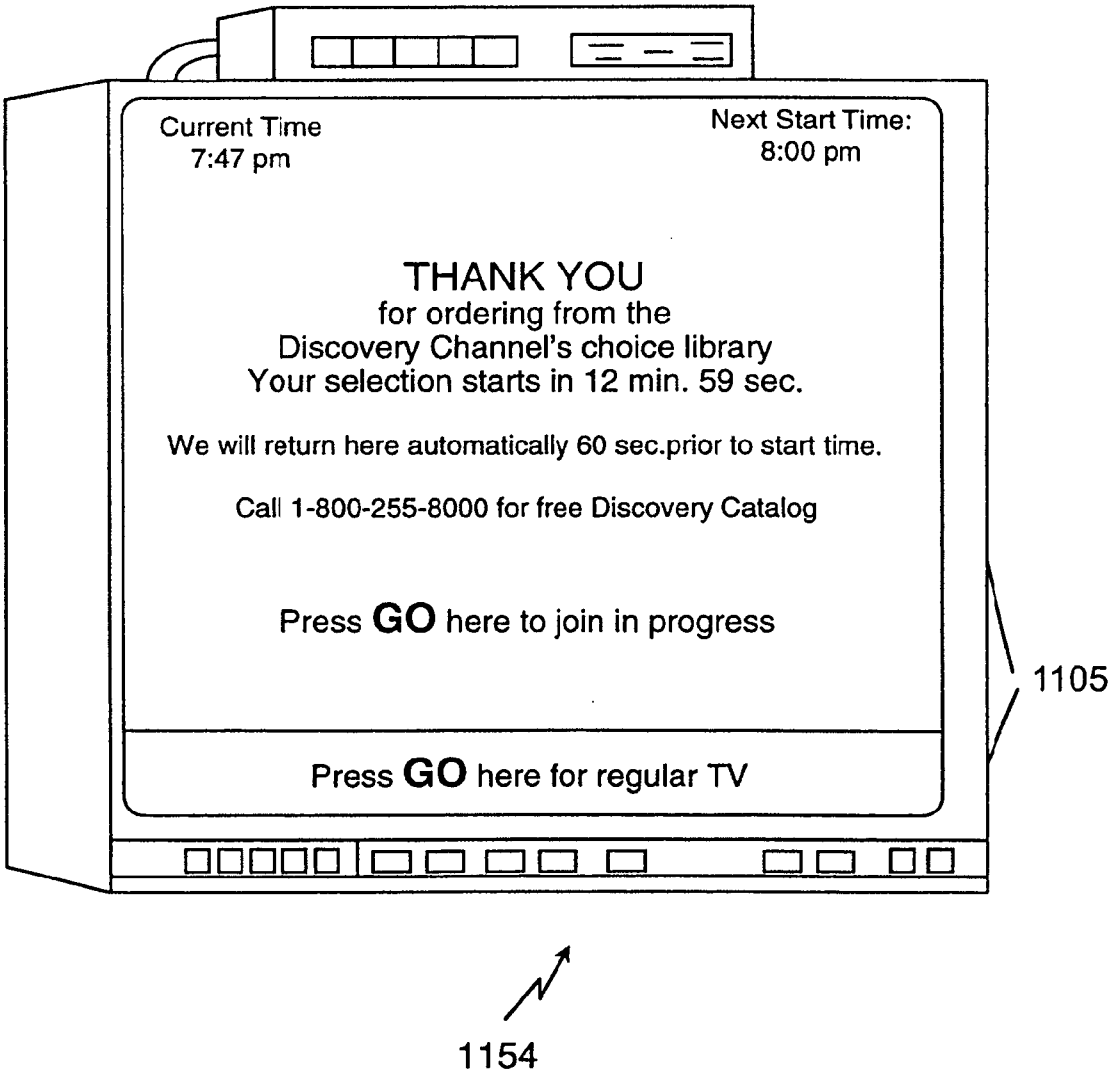
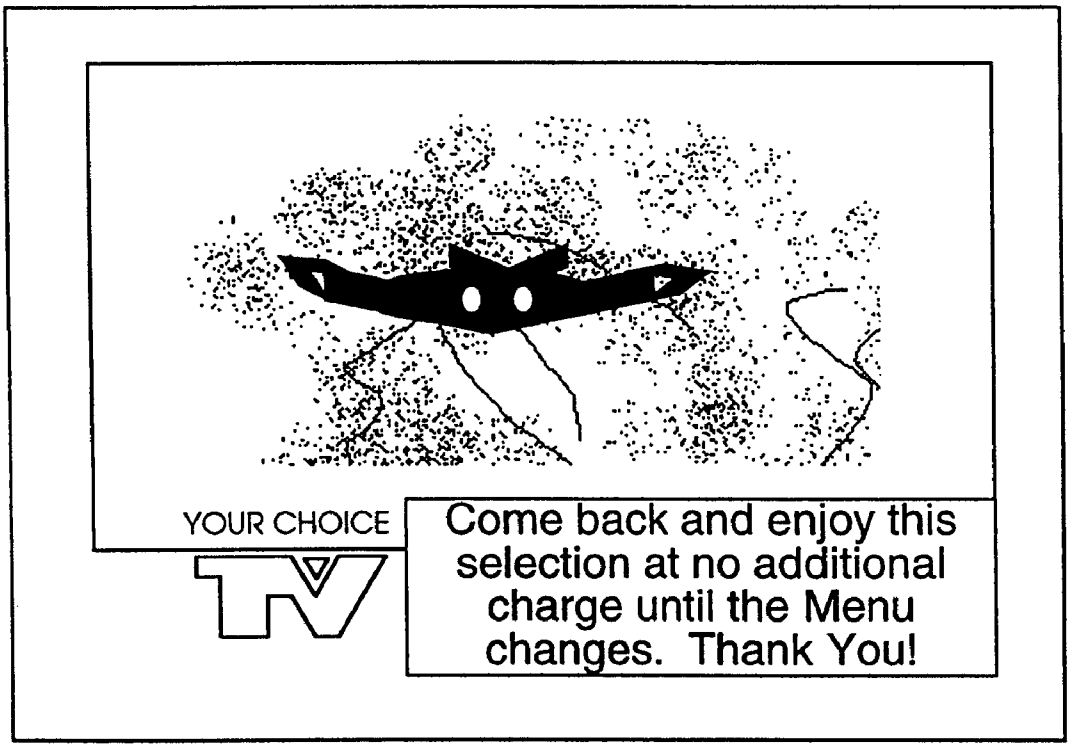

Current Time
7:47 pm
Next Start Time:
8:00 pm
THANK YOU
for ordering from the
Discovery Channel's choice library
Your selection starts in 12 min. 59 sec.
We will return here automatically 60 sec.prior to start time.
Call 1-800-255-8000 for free Discovery Catalog
Press GO here to join in progress
Press GO here for regular TV
1105
1154

Fig. 29c


YOUR CHOICE
TV
Come back and enjoy this selection at no additional charge until the Menu changes. Thank You!

1156

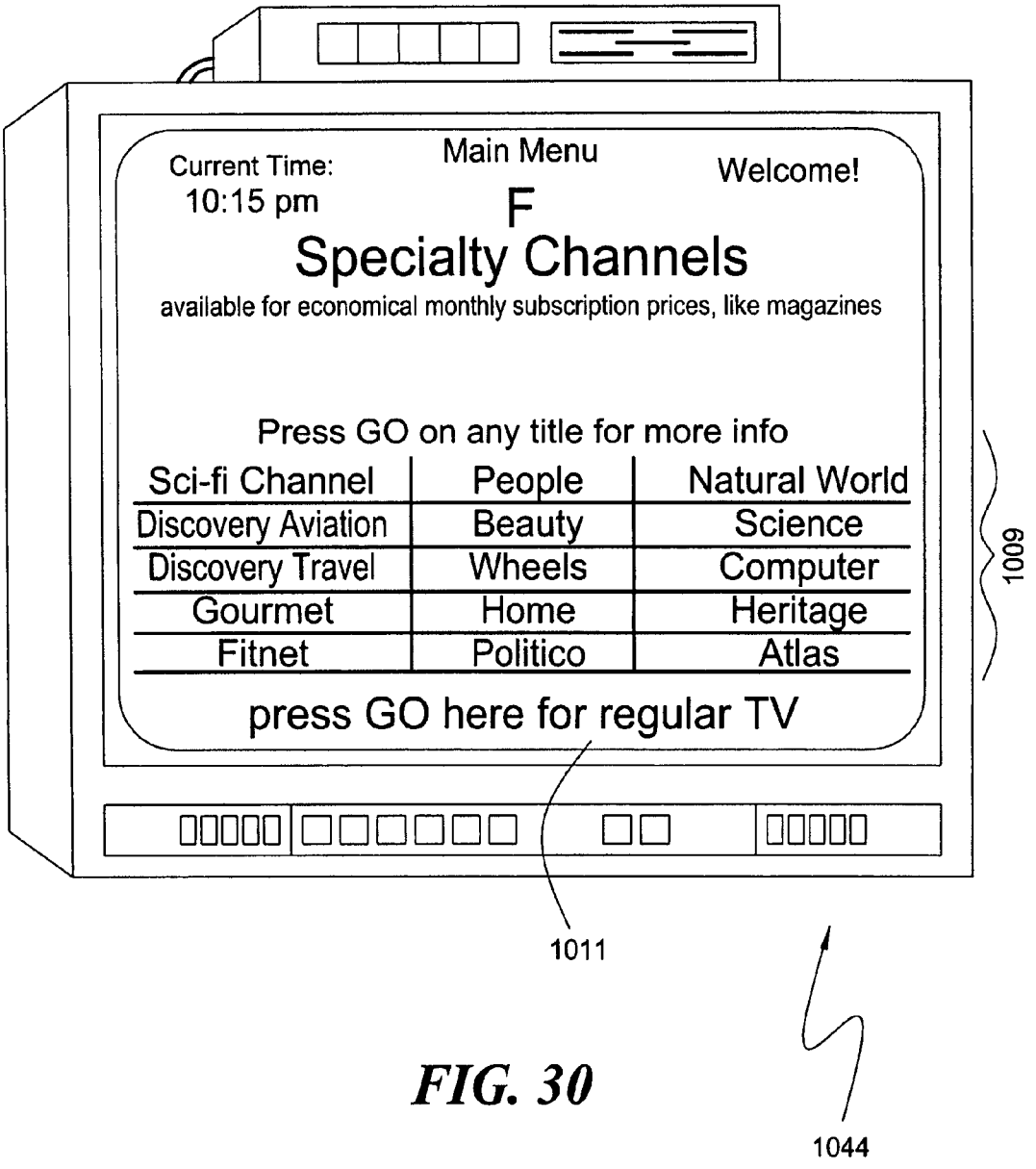

Current Time:
10:15 pm
Main Menu
F
Welcome!
Specialty Channels
available for economical monthly subscription prices, like magazines
Press GO on any title for more info
Sci-fi Channel
People
Natural World
Discovery Aviation
Beauty
Science
Discovery Travel
Wheels
Computer
Gourmet
Home
Heritage
Fitnet
Politico
Atlas
press GO here for regular TV
1009
1011
1044

FIG. 30

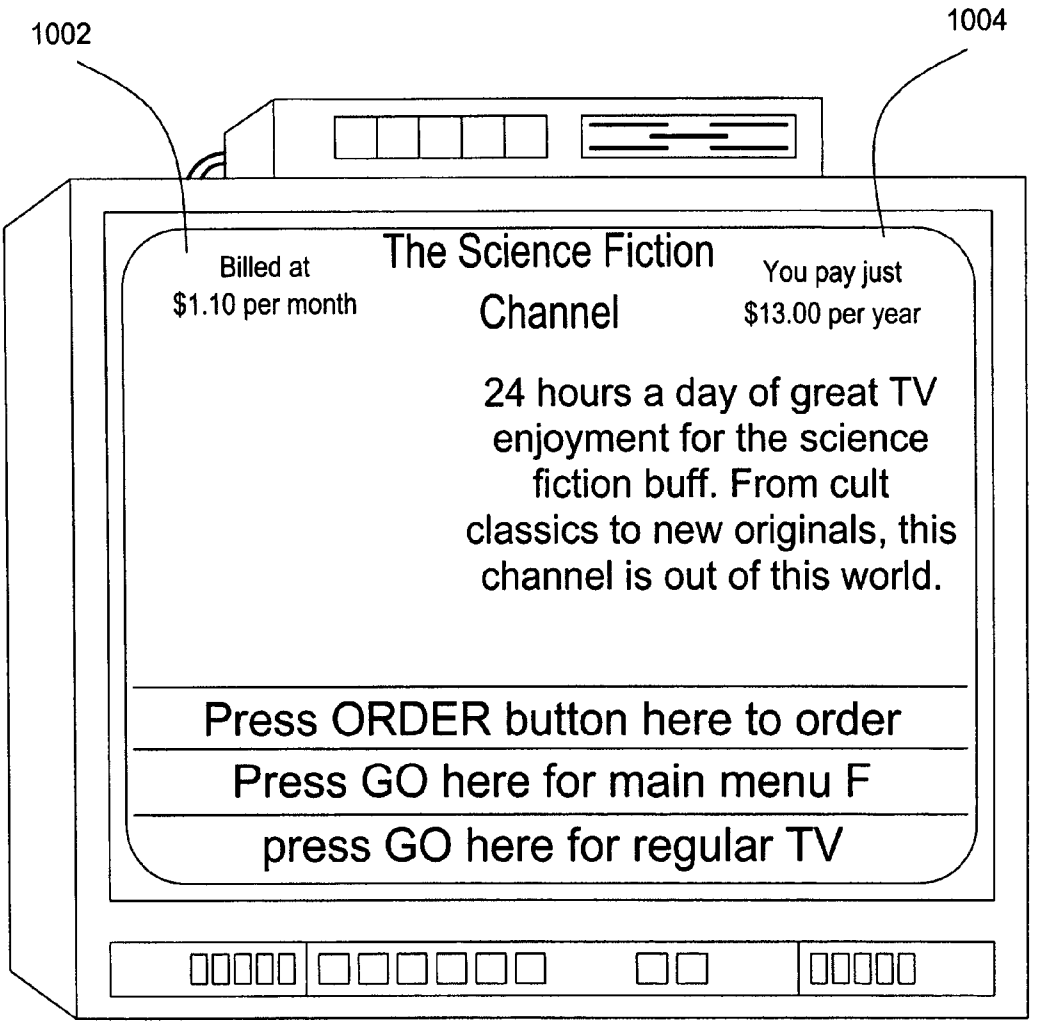

1002
1004
Billed at
$1.10 per month
The Science Fiction
Channel
You pay just
$13.00 per year
24 hours a day of great TV enjoyment for the science fiction buff. From cult classics to new originals, this channel is out of this world.
Press ORDER button here to order
Press GO here for main menu F
press GO here for regular TV
1160

FIG. 31


Thank you for subscribing!
You are joining the channel in progress.
1164

FIG. 32


You are a current subscriber.
Thank you!
...joining now in progress
1156

FIG. 33

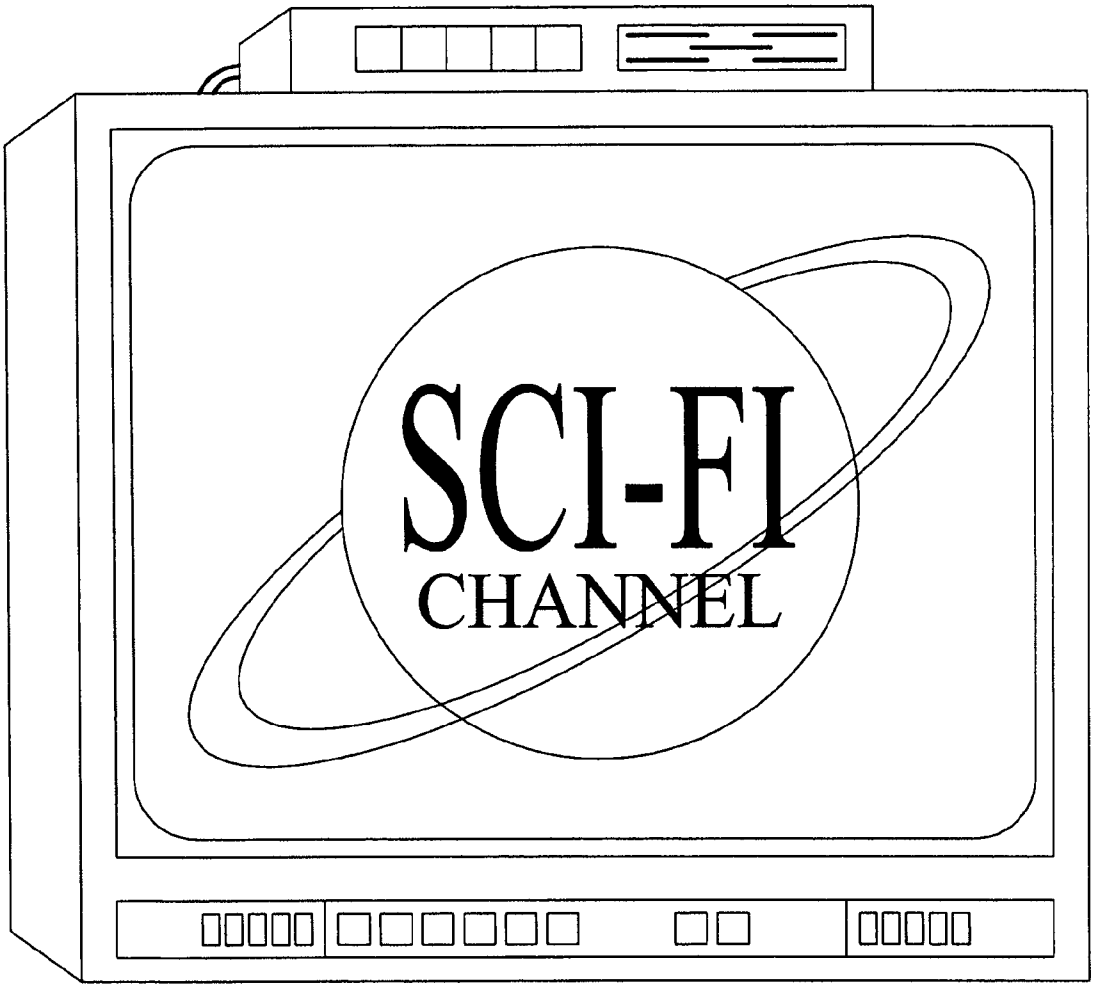


FIG. 34

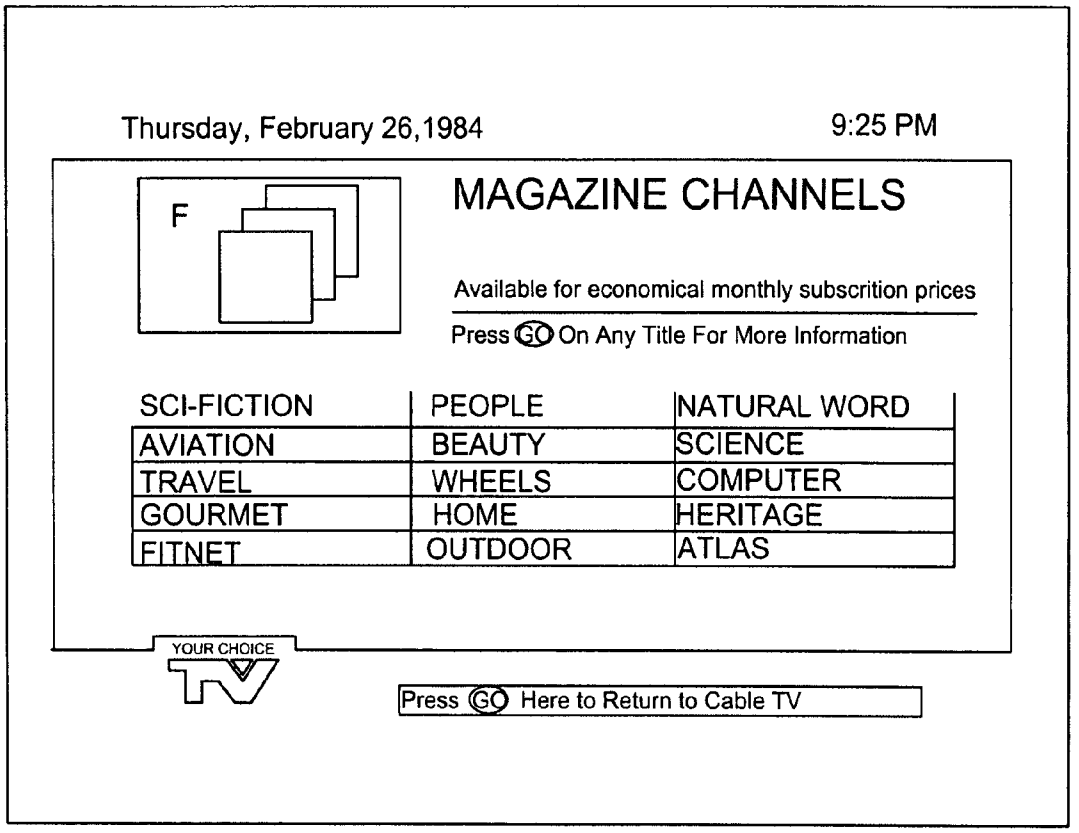

Thursday, February 26,1984
9:25 PM
F
MAGAZINE CHANNELS
Available for economical monthly subscrition prices
Press GO On Any Title For More Information
SCI-FICTION
PEOPLE
NATURAL WORD
AVIATION
BEAUTY
SCIENCE
TRAVEL
WHEELS
COMPUTER
GOURMET
HOME
HERITAGE
FITNET
OUTDOOR
ATLAS
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1030

FIG. 35

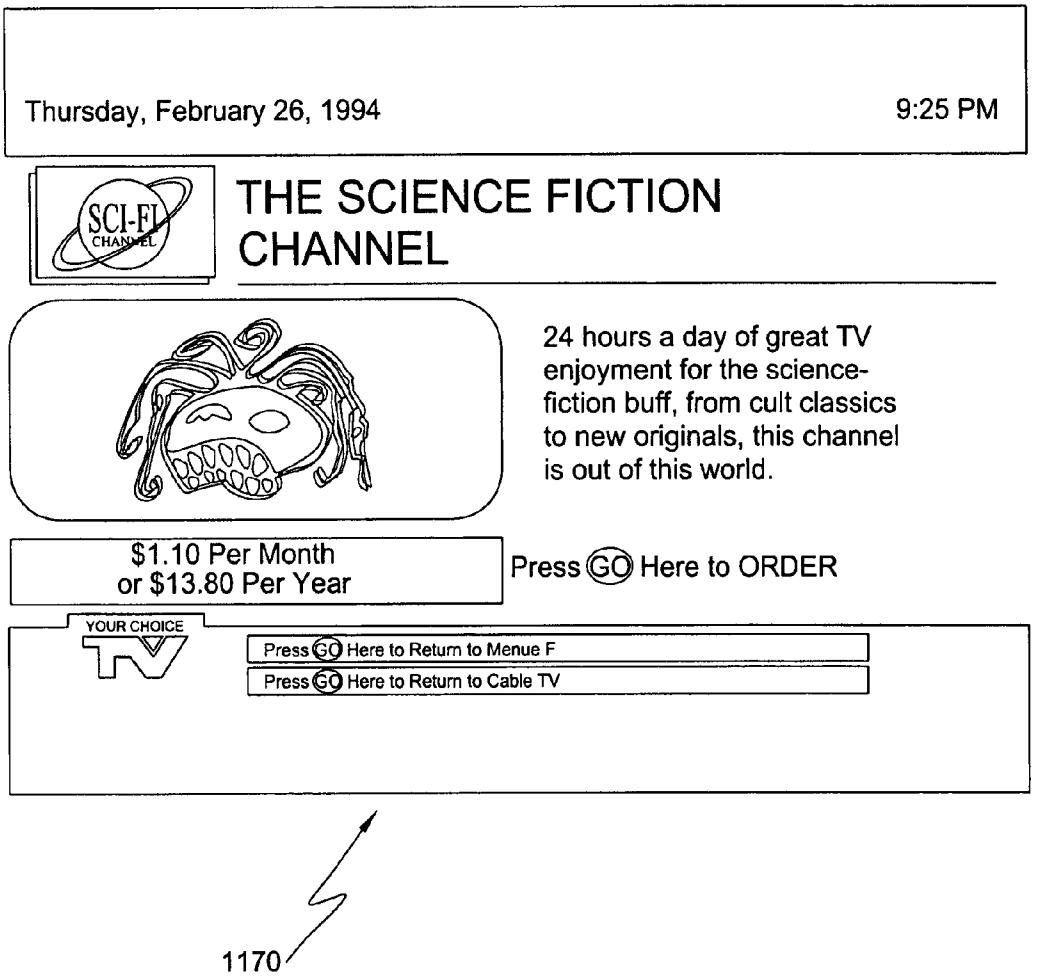

Thursday, February 26, 1994
9:25 PM
SCI-FI CHANNEL
THE SCIENCE FICTION CHANNEL
24 hours a day of great TV enjoyment for the science-fiction buff, from cult classics to new originals, this channel is out of this world.
$1.10 Per Month
or $13.80 Per Year
Press GO Here to ORDER
YOUR CHOICE TV
Press GO Here to Return to Menue F
Press GO Here to Return to Cable TV
1170

FIG. 36

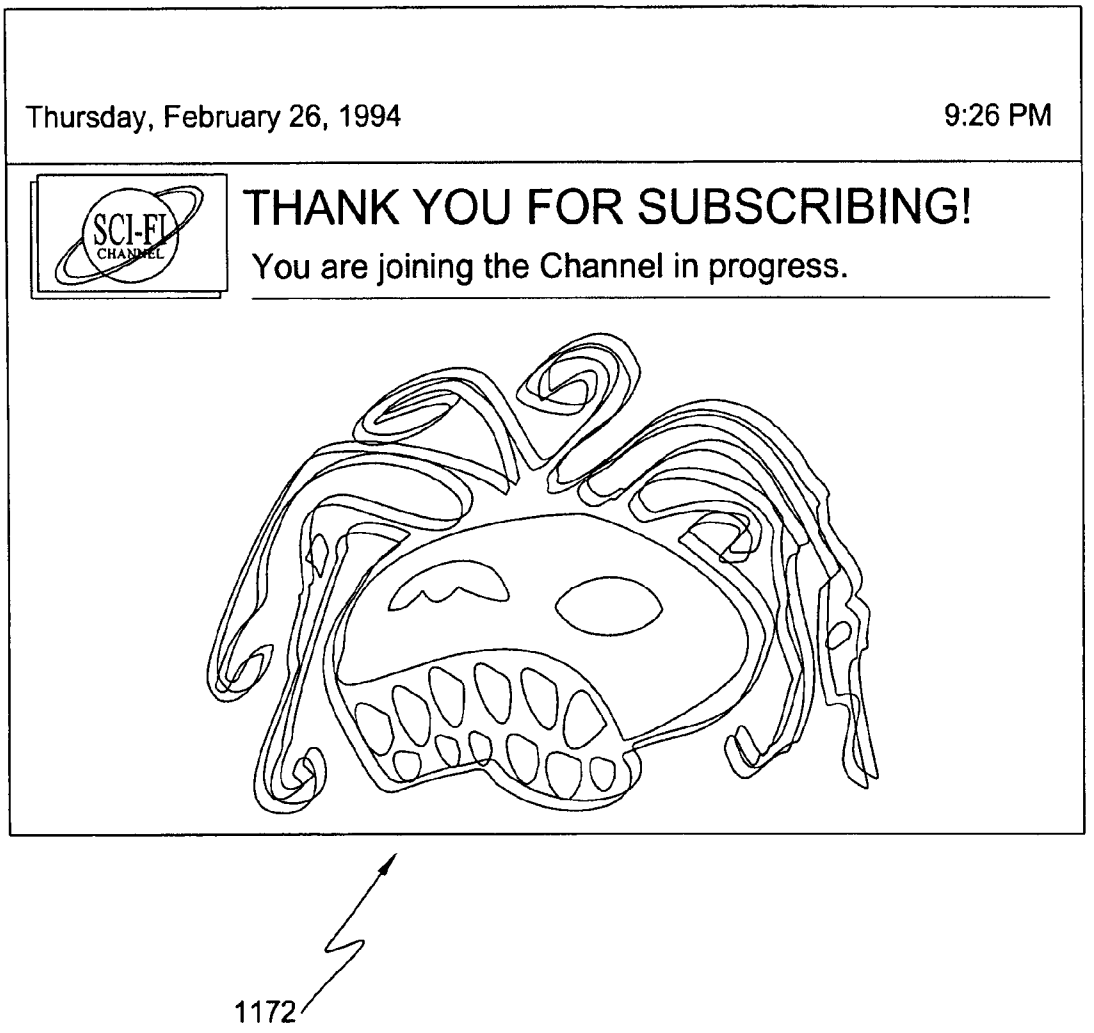

Thursday, February 26, 1994
9:26 PM
SCI-FI
CHANNEL
THANK YOU FOR SUBSCRIBING!
You are joining the Channel in progress.
1172

FIG. 37

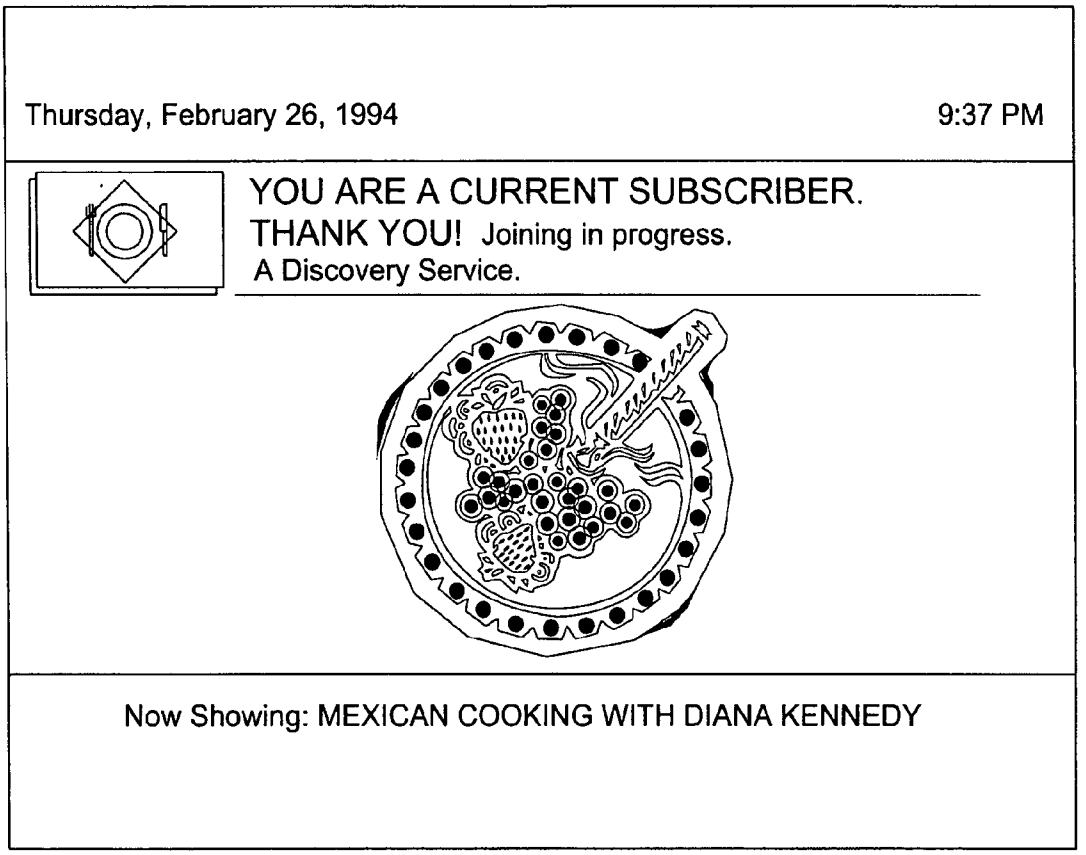

Thursday, February 26, 1994
9:37 PM
YOU ARE A CURRENT SUBSCRIBER.
THANK YOU! Joining in progress.
A Discovery Service.
Now Showing: MEXICAN COOKING WITH DIANA KENNEDY
1173

FIG. 38

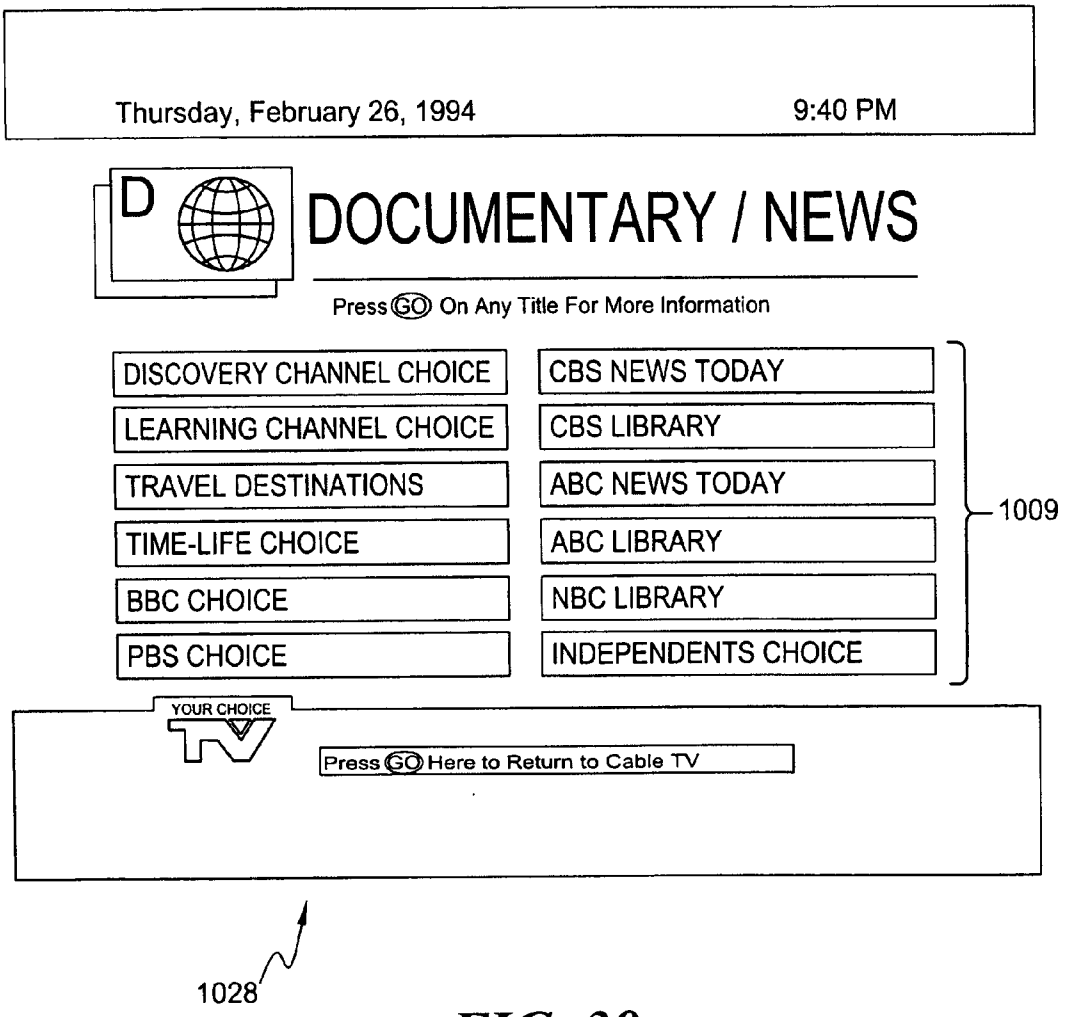

Thursday, February 26, 1994
9:40 PM
D
DOCUMENTARY / NEWS
Press GO On Any Title For More Information
DISCOVERY CHANNEL CHOICE
LEARNING CHANNEL CHOICE
TRAVEL DESTINATIONS
TIME-LIFE CHOICE
BBC CHOICE
PBS CHOICE
CBS NEWS TODAY
CBS LIBRARY
ABC NEWS TODAY
ABC LIBRARY
NBC LIBRARY
INDEPENDENTS CHOICE
1009
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1028

FIG. 39

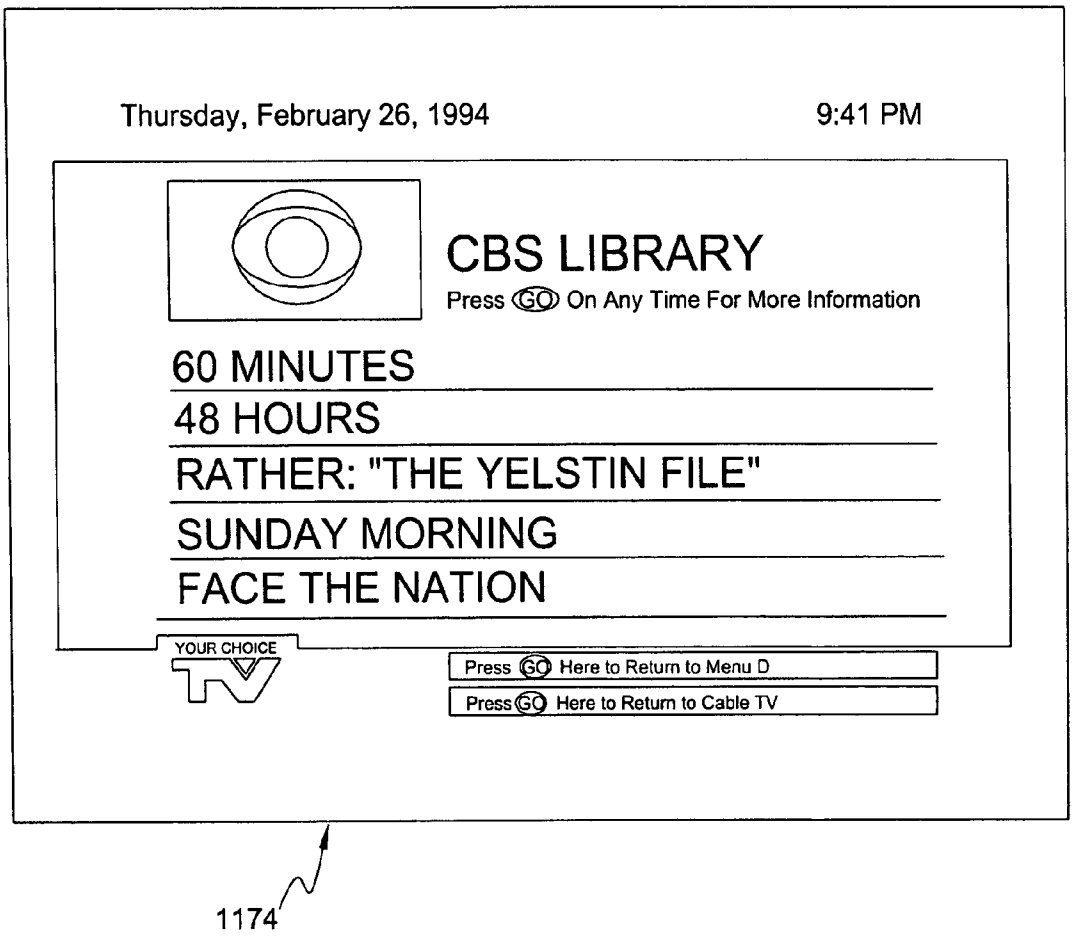

Thursday, February 26, 1994
9:41 PM
CBS LIBRARY
Press GO On Any Time For More Information
60 MINUTES
48 HOURS
RATHER: "THE YELSTIN FILE"
SUNDAY MORNING
FACE THE NATION
YOUR CHOICE TV
Press GO Here to Return to Menu D
Press GO Here to Return to Cable TV
1174

FIG. 40

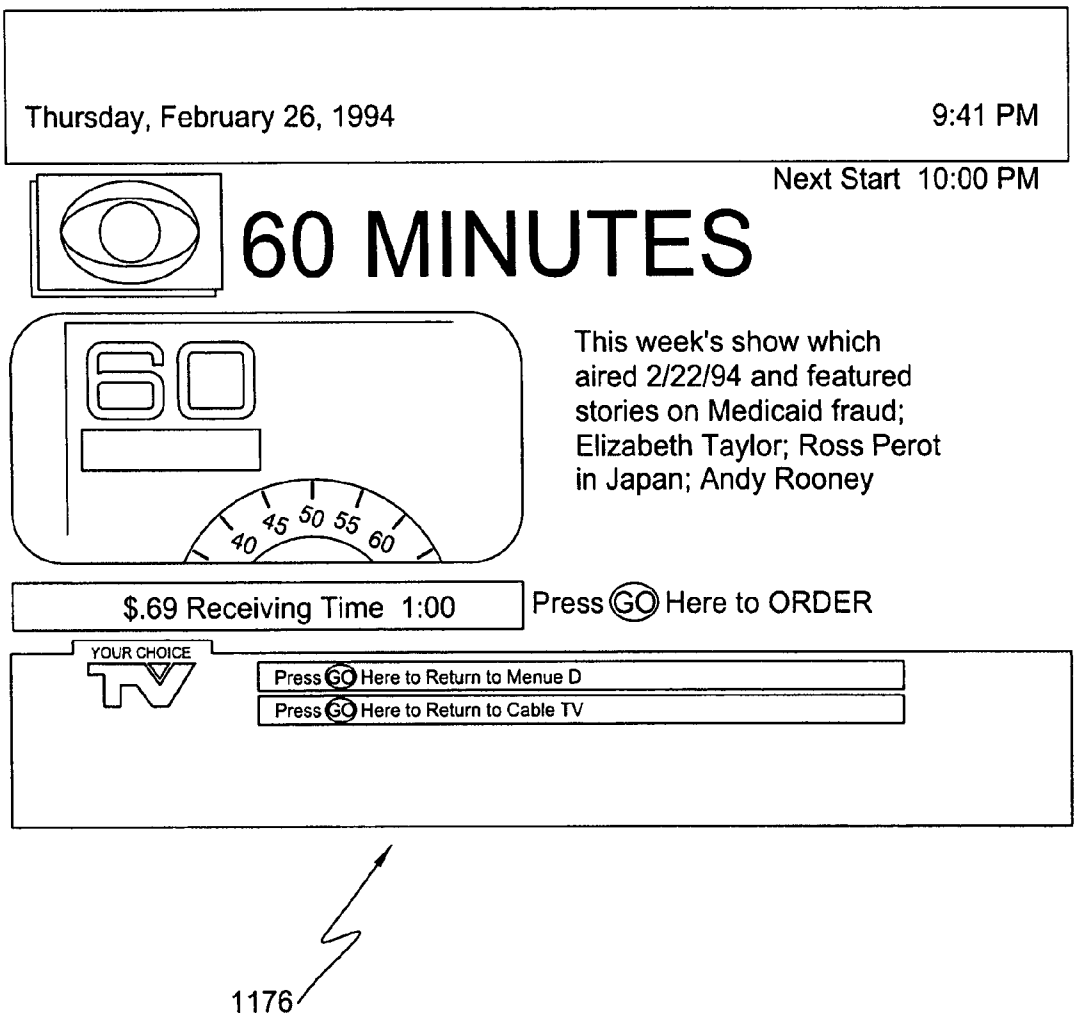

Thursday, February 26, 1994
9:41 PM
Next Start 10:00 PM
60 MINUTES
60
40 45 50 55 60
This week's show which aired 2/22/94 and featured stories on Medicaid fraud; Elizabeth Taylor; Ross Perot in Japan; Andy Rooney
$.69 Receiving Time 1:00
Press GO Here to ORDER
YOUR CHOICE TV
Press GO Here to Return to Menue D
Press GO Here to Return to Cable TV
1176

FIG. 41

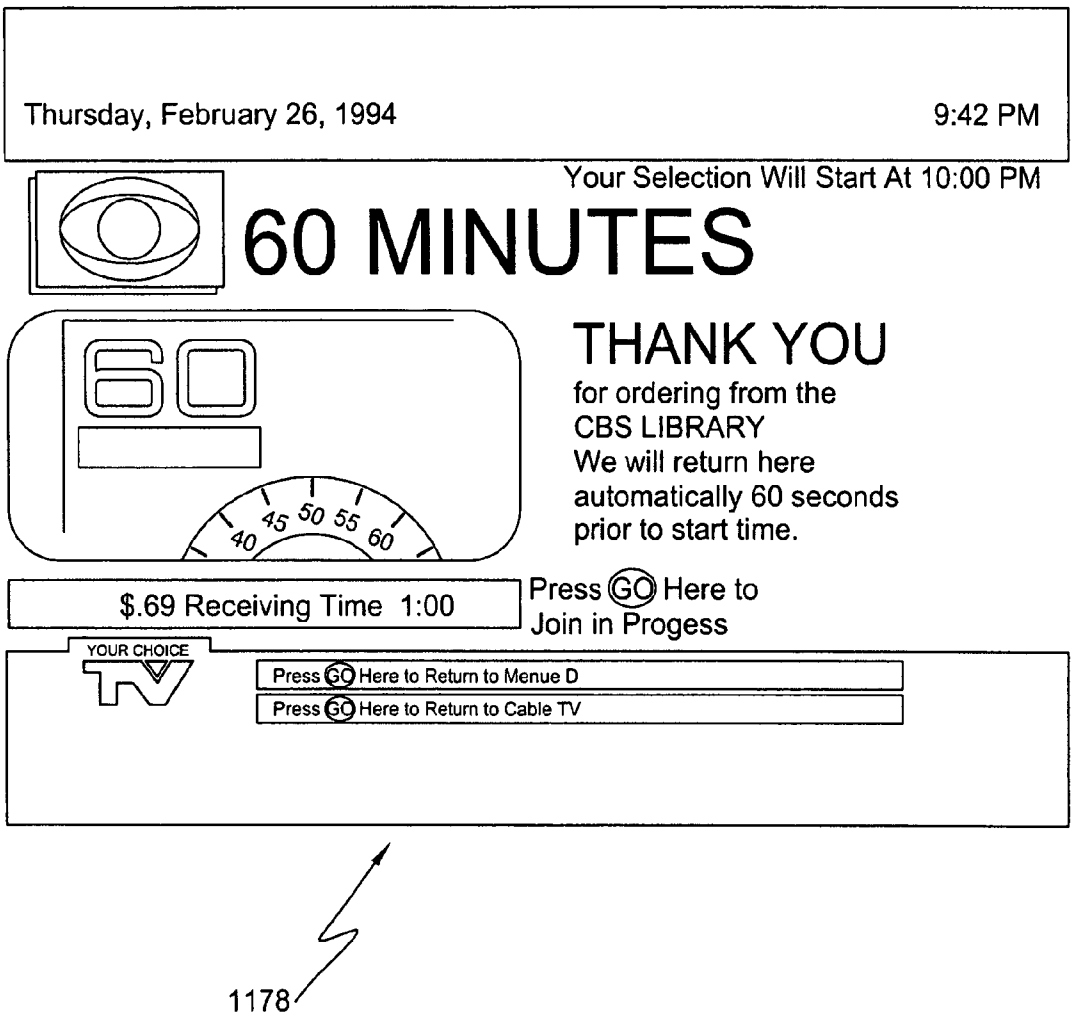

Thursday, February 26, 1994
9:42 PM
Your Selection Will Start At 10:00 PM
60 MINUTES
60
40 45 50 55 60
THANK YOU
for ordering from the
CBS LIBRARY
We will return here
automatically 60 seconds
prior to start time.
$.69 Receiving Time 1:00
Press GO Here to
Join in Progess
YOUR CHOICE TV
Press GO Here to Return to Menue D
Press GO Here to Return to Cable TV
1178

FIG. 42

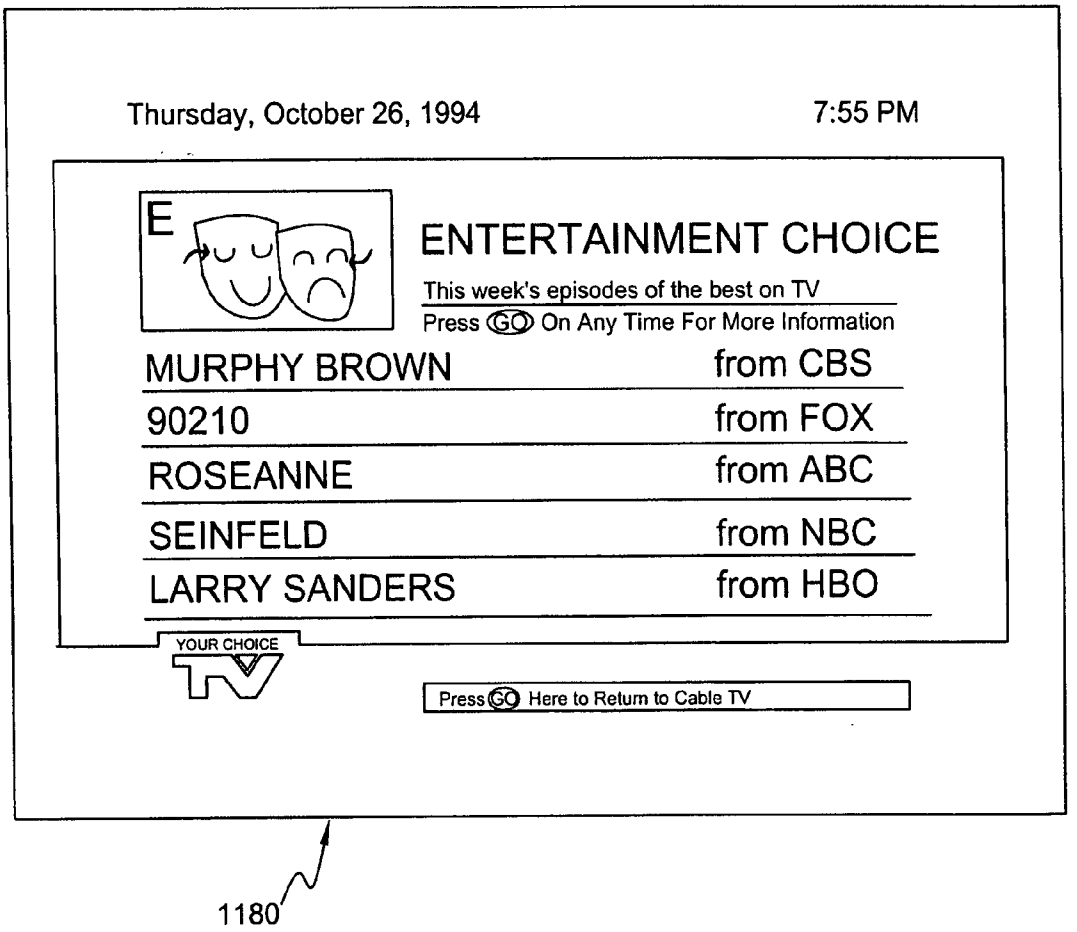
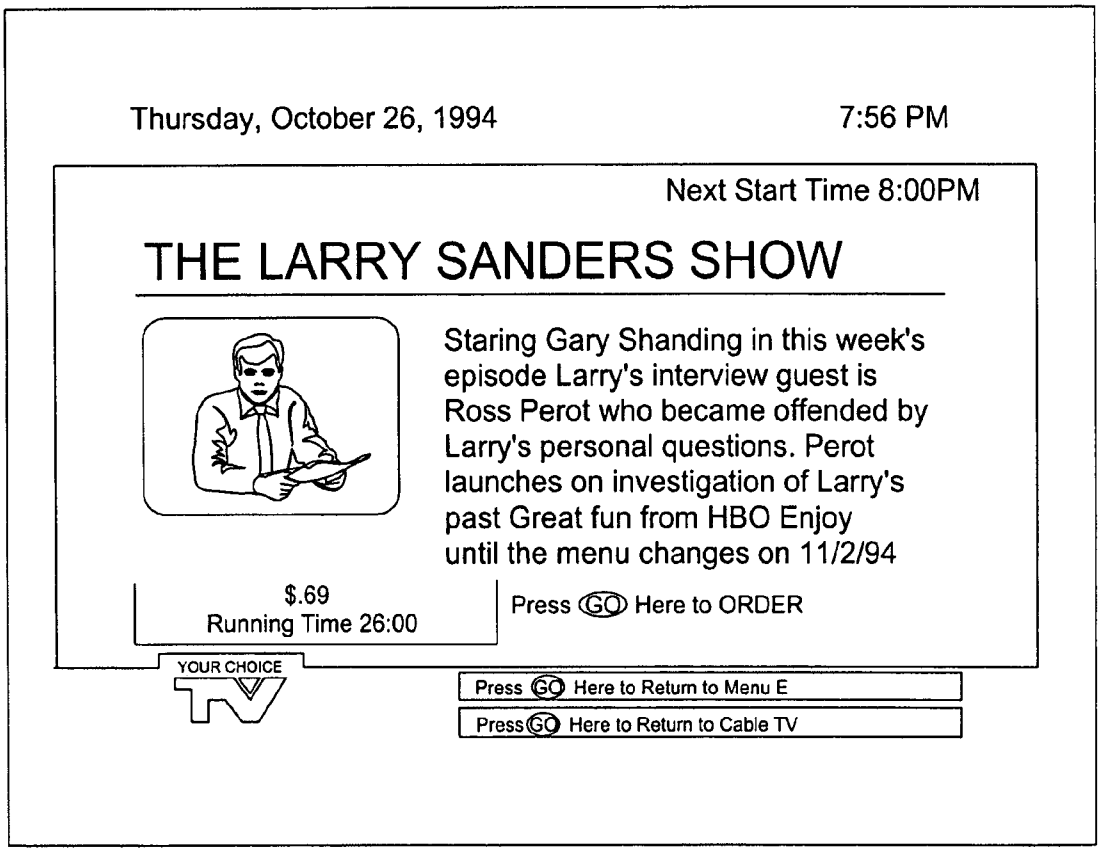

Thursday, October 26, 1994
7:55 PM
E
ENTERTAINMENT CHOICE
This week's episodes of the best on TV
Press GO On Any Time For More Information
MURPHY BROWN from CBS
90210 from FOX
ROSEANNE from ABC
SEINFELD from NBC
LARRY SANDERS from HBO
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1180

FIG. 43


Thursday, October 26, 1994
7:56 PM
Next Start Time 8:00PM
THE LARRY SANDERS SHOW
Staring Gary Shanding in this week's episode Larry's interview guest is Ross Perot who became offended by Larry's personal questions. Perot launches on investigation of Larry's past Great fun from HBO Enjoy until the menu changes on 11/2/94
$.69
Running Time 26:00
Press GO Here to ORDER
YOUR CHOICE TV
Press GO Here to Return to Menu E
Press GO Here to Return to Cable TV

1182

FIG. 44

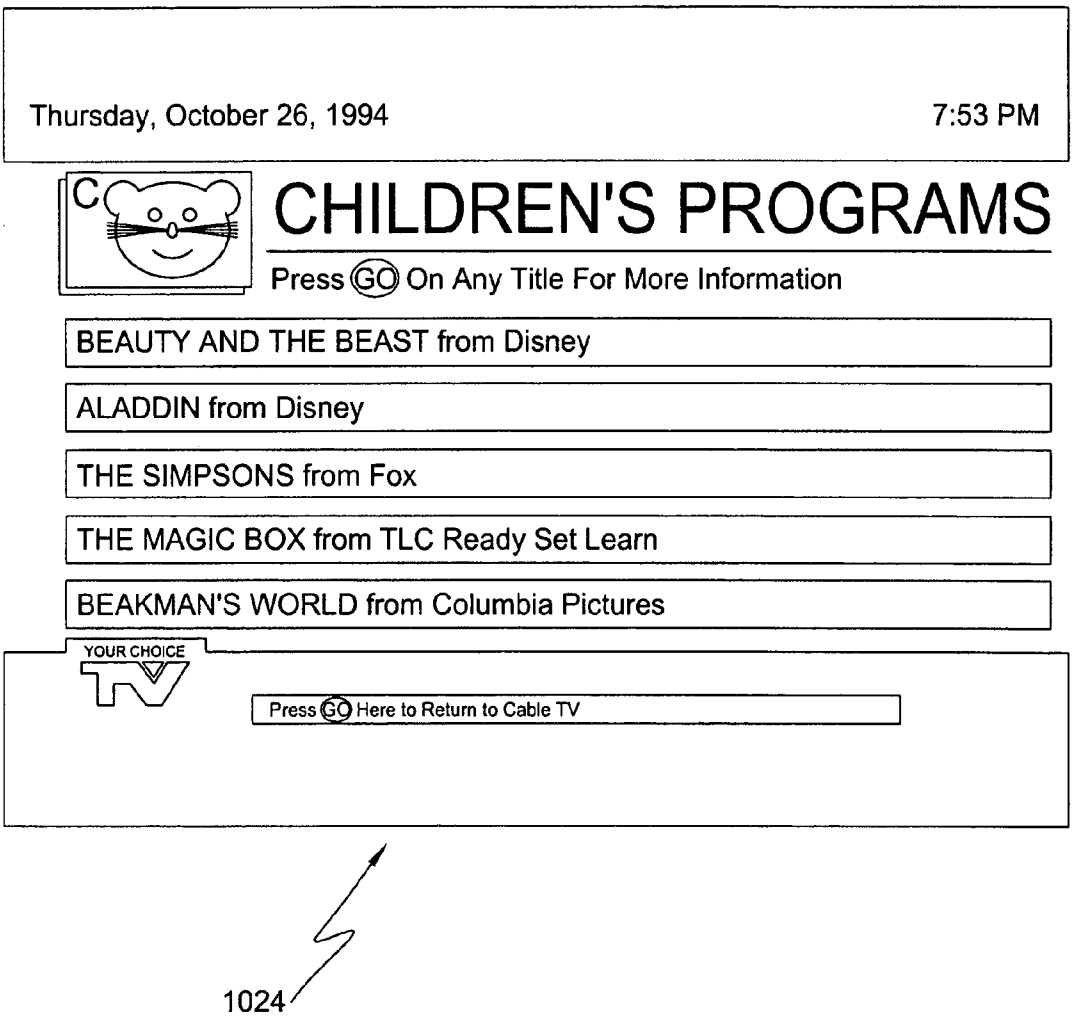
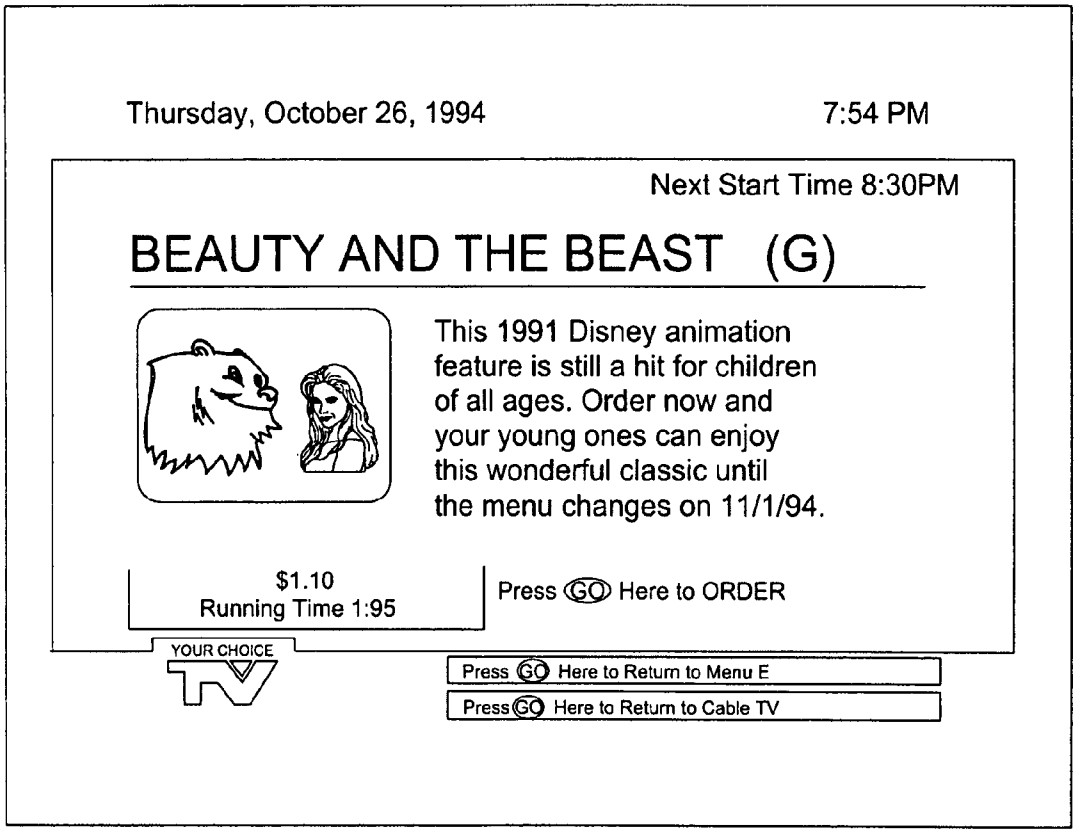

Thursday, October 26, 1994
7:53 PM
CHILDREN'S PROGRAMS
Press GO On Any Title For More Information
BEAUTY AND THE BEAST from Disney
ALADDIN from Disney
THE SIMPSONS from Fox
THE MAGIC BOX from TLC Ready Set Learn
BEAKMAN'S WORLD from Columbia Pictures
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1024

FIG. 45


Thursday, October 26, 1994
7:54 PM
Next Start Time 8:30PM
BEAUTY AND THE BEAST (G)
This 1991 Disney animation feature is still a hit for children of all ages. Order now and your young ones can enjoy this wonderful classic until the menu changes on 11/1/94.
$1.10
Running Time 1:95
Press GO Here to ORDER
YOUR CHOICE TV
Press GO Here to Return to Menu E
Press GO Here to Return to Cable TV

1058

FIG. 46

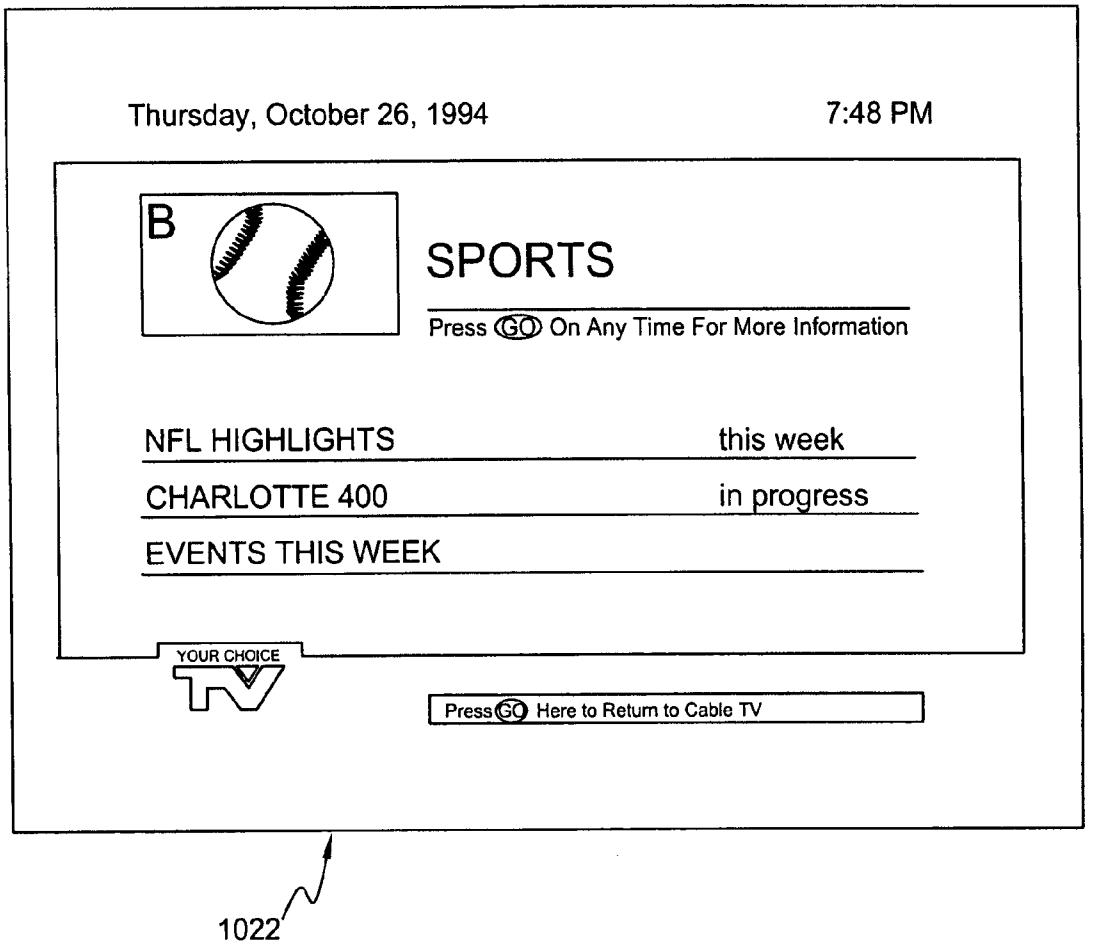

Thursday, October 26, 1994
7:48 PM
B
SPORTS
Press GO On Any Time For More Information
NFL HIGHLIGHTS
this week
CHARLOTTE 400
in progress
EVENTS THIS WEEK
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1022

FIG. 47

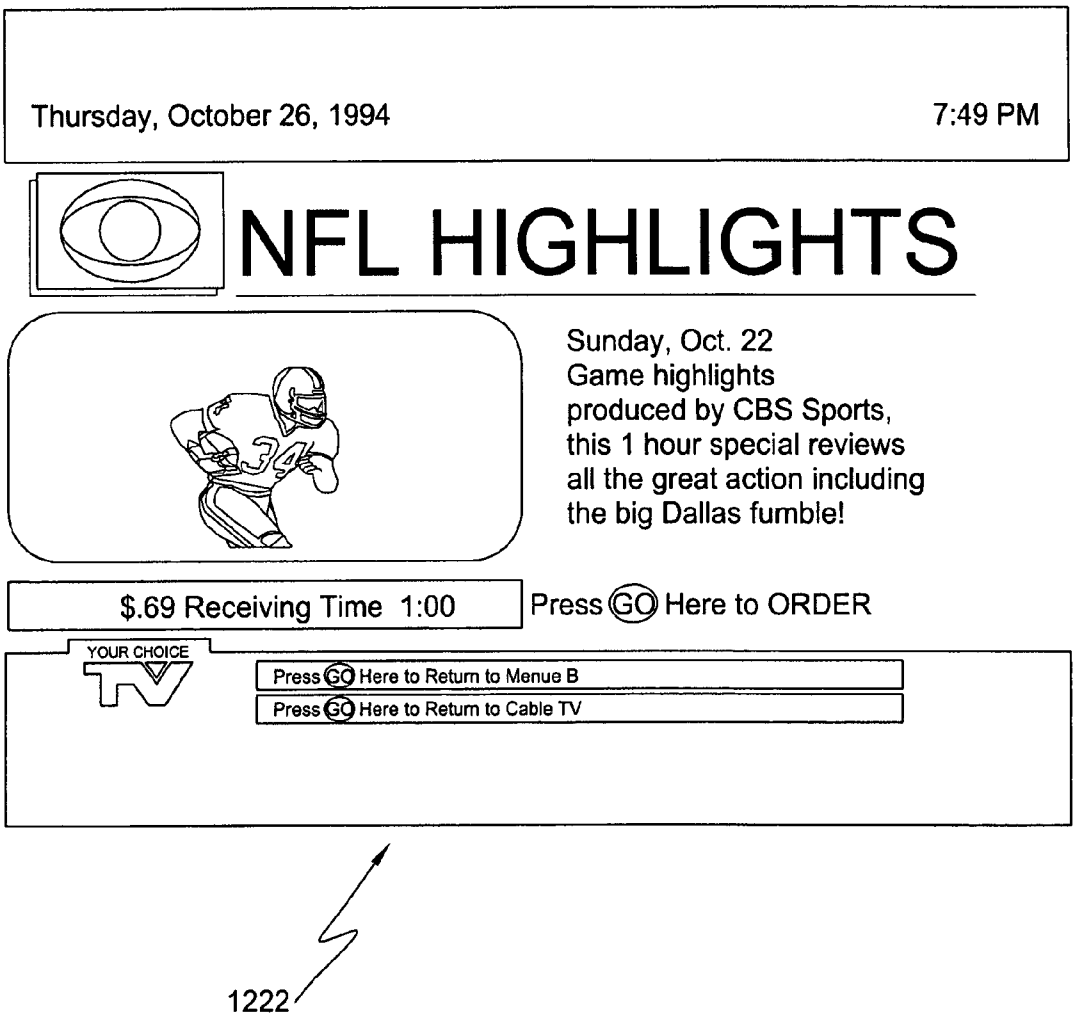

Thursday, October 26, 1994
7:49 PM
NFL HIGHLIGHTS
Sunday, Oct. 22
Game highlights
produced by CBS Sports,
this 1 hour special reviews
all the great action including
the big Dallas fumble!
$.69 Receiving Time 1:00
Press GO Here to ORDER
YOUR CHOICE
TV
Press GO Here to Return to Menue B
Press GO Here to Return to Cable TV
1222

FIG. 48

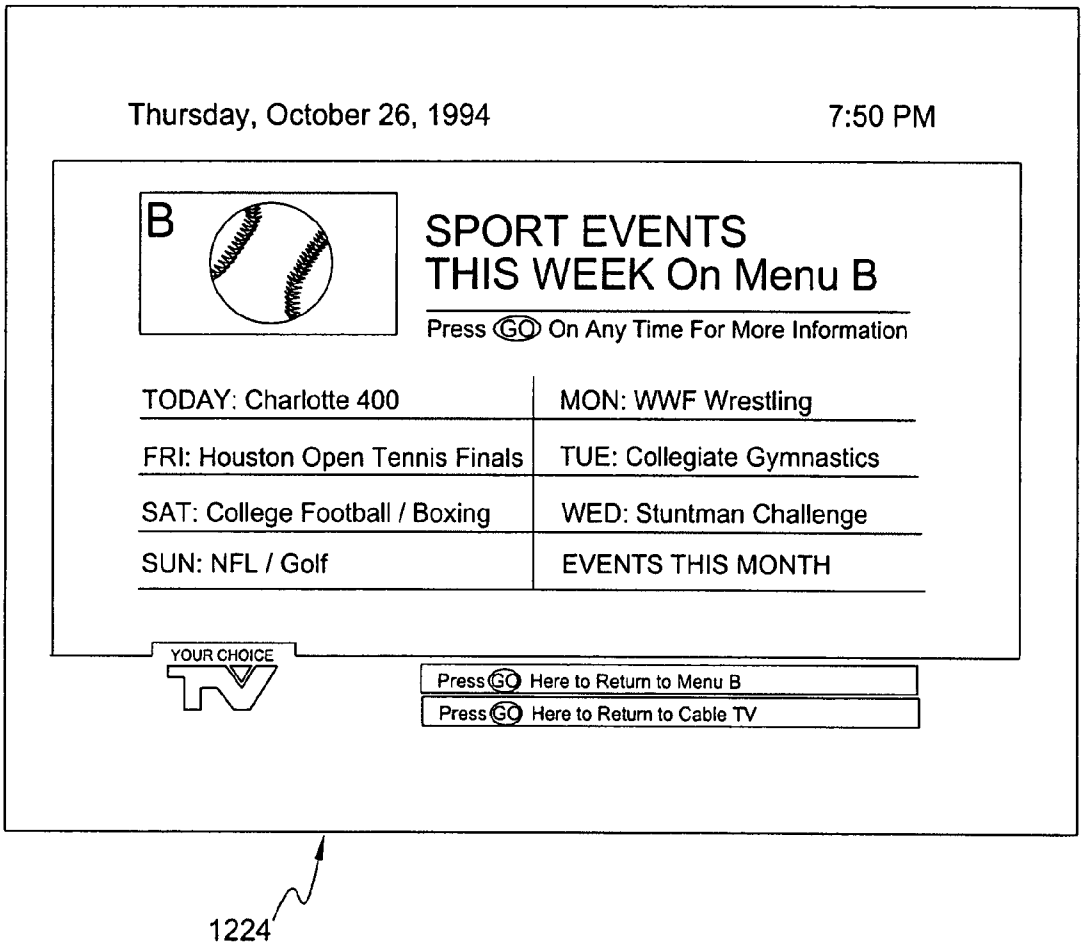

Thursday, October 26, 1994
7:50 PM
B
SPORT EVENTS
THIS WEEK On Menu B
Press GO On Any Time For More Information
TODAY: Charlotte 400
MON: WWF Wrestling
FRI: Houston Open Tennis Finals
TUE: Collegiate Gymnastics
SAT: College Football / Boxing
WED: Stuntman Challenge
SUN: NFL / Golf
EVENTS THIS MONTH
YOUR CHOICE TV
Press GO Here to Return to Menu B
Press GO Here to Return to Cable TV
1224

FIG. 49a

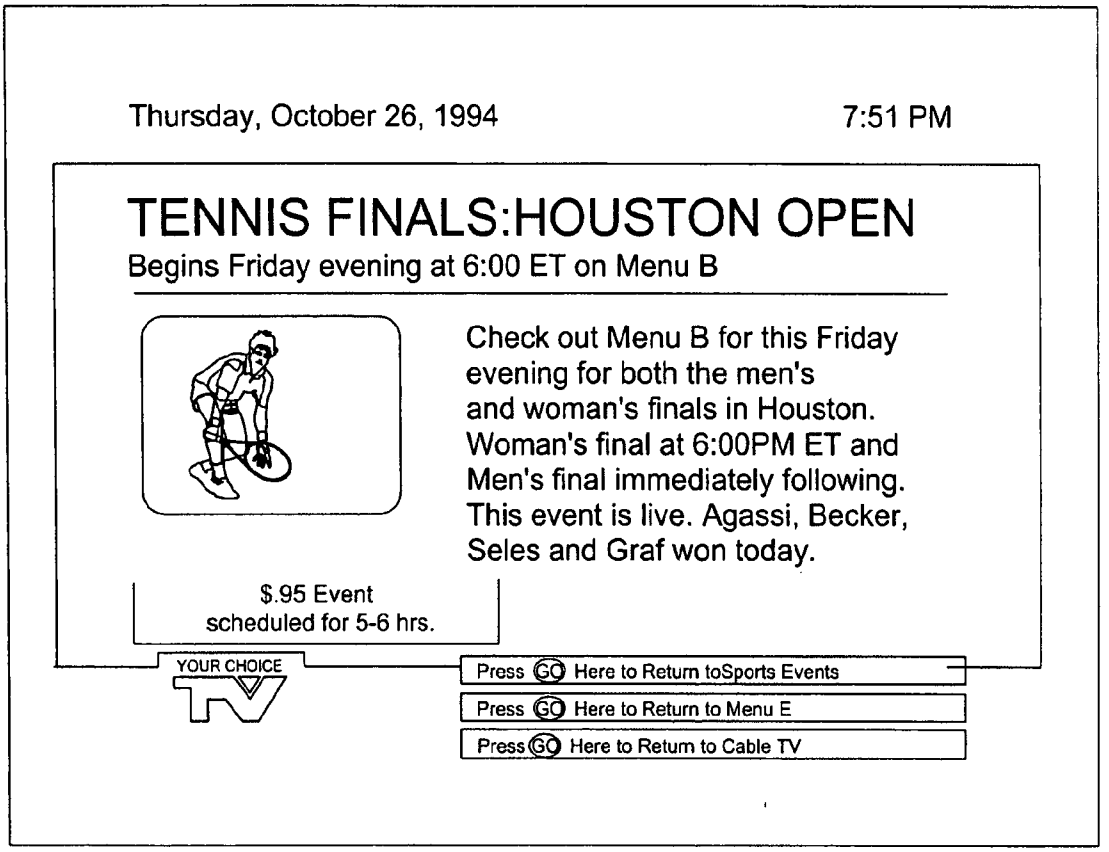

Thursday, October 26, 1994
7:51 PM
TENNIS FINALS:HOUSTON OPEN
Begins Friday evening at 6:00 ET on Menu B
Check out Menu B for this Friday evening for both the men's and woman's finals in Houston. Woman's final at 6:00PM ET and Men's final immediately following. This event is live. Agassi, Becker, Seles and Graf won today.
$.95 Event scheduled for 5-6 hrs.
YOUR CHOICE TV
Press GO Here to Return toSports Events
Press GO Here to Return to Menu E
Press GO Here to Return to Cable TV
1226

FIG. 49b

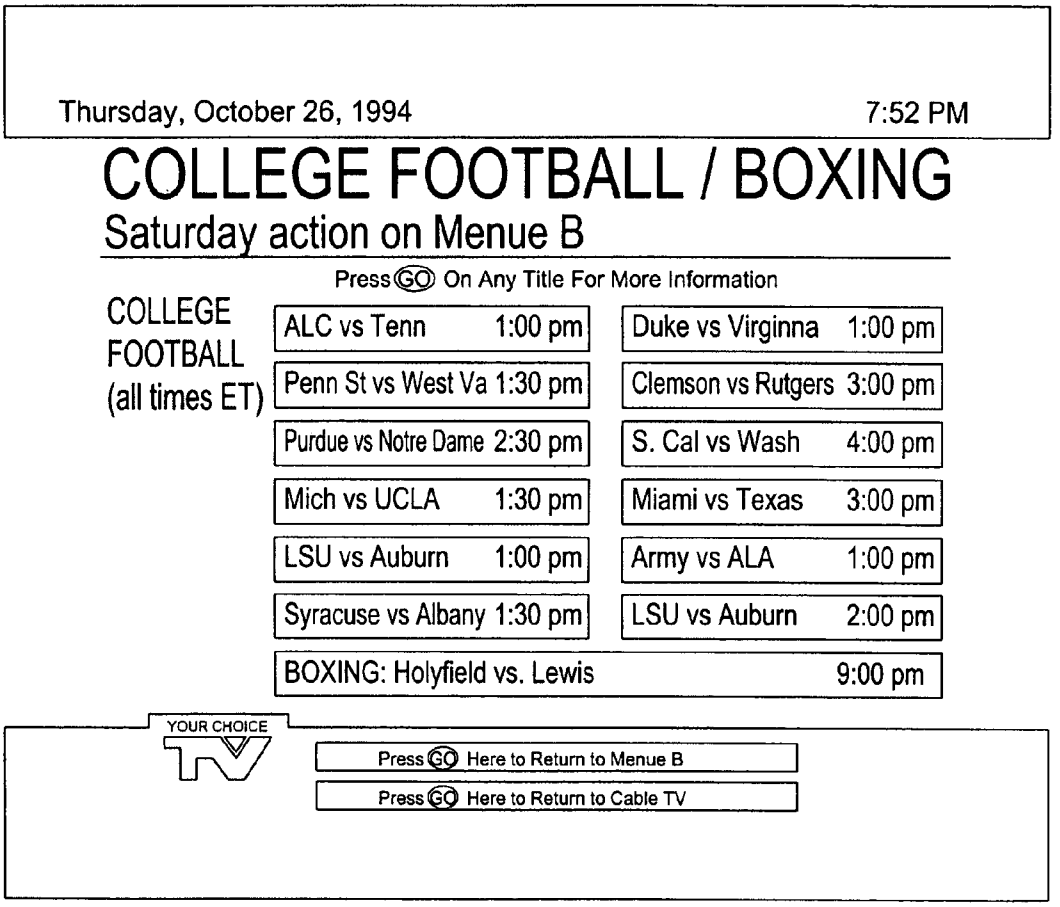

Thursday, October 26, 1994
7:52 PM
COLLEGE FOOTBALL / BOXING
Saturday action on Menue B
Press GO On Any Title For More Information
COLLEGE FOOTBALL (all times ET)
ALC vs Tenn 1:00 pm
Penn St vs West Va 1:30 pm
Purdue vs Notre Dame 2:30 pm
Mich vs UCLA 1:30 pm
LSU vs Auburn 1:00 pm
Syracuse vs Albany 1:30 pm
Duke vs Virginna 1:00 pm
Clemson vs Rutgers 3:00 pm
S. Cal vs Wash 4:00 pm
Miami vs Texas 3:00 pm
Army vs ALA 1:00 pm
LSU vs Auburn 2:00 pm
BOXING: Holyfield vs. Lewis 9:00 pm
YOUR CHOICE TV
Press GO Here to Return to Menue B
Press GO Here to Return to Cable TV
1228

FIG. 49c

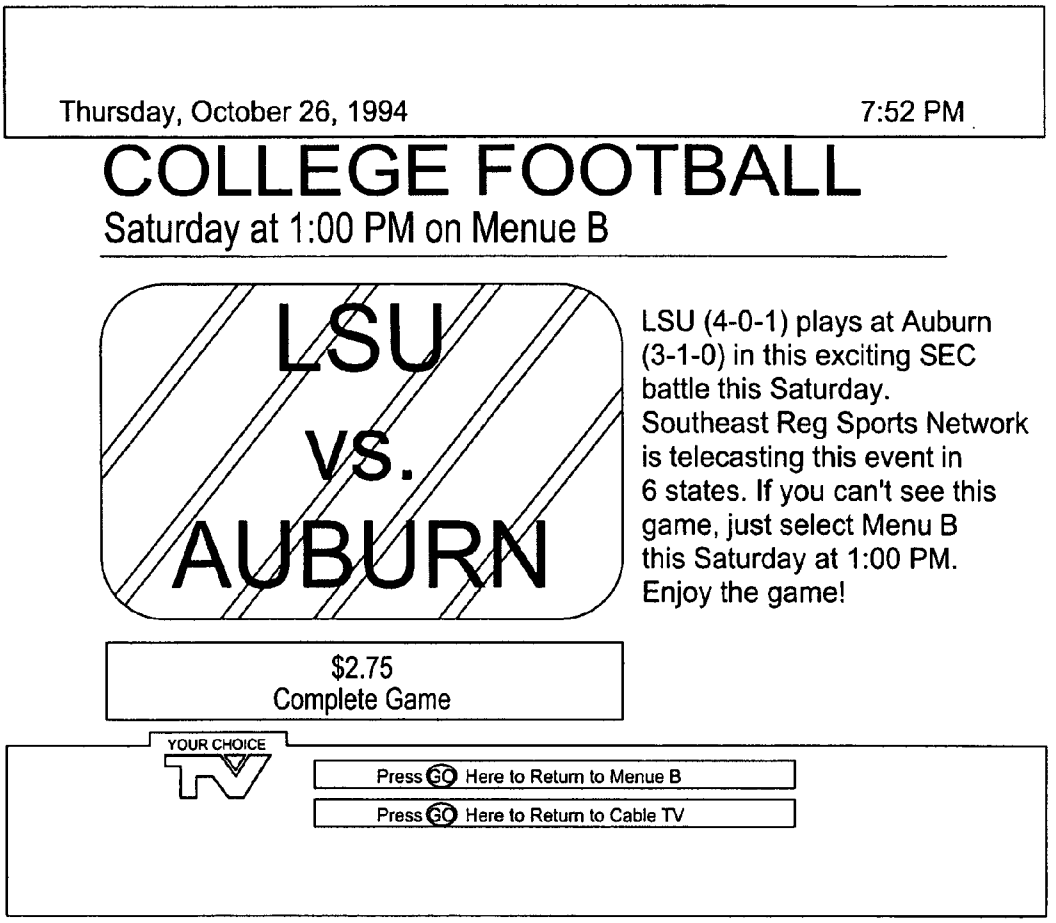

Thursday, October 26, 1994
7:52 PM
COLLEGE FOOTBALL
Saturday at 1:00 PM on Menue B
LSU
VS.
AUBURN
LSU (4-0-1) plays at Auburn (3-1-0) in this exciting SEC battle this Saturday. Southeast Reg Sports Network is telecasting this event in 6 states. If you can't see this game, just select Menu B this Saturday at 1:00 PM. Enjoy the game!
$2.75
Complete Game
YOUR CHOICE TV
Press GO Here to Return to Menue B
Press GO Here to Return to Cable TV
1229

FIG. 49d

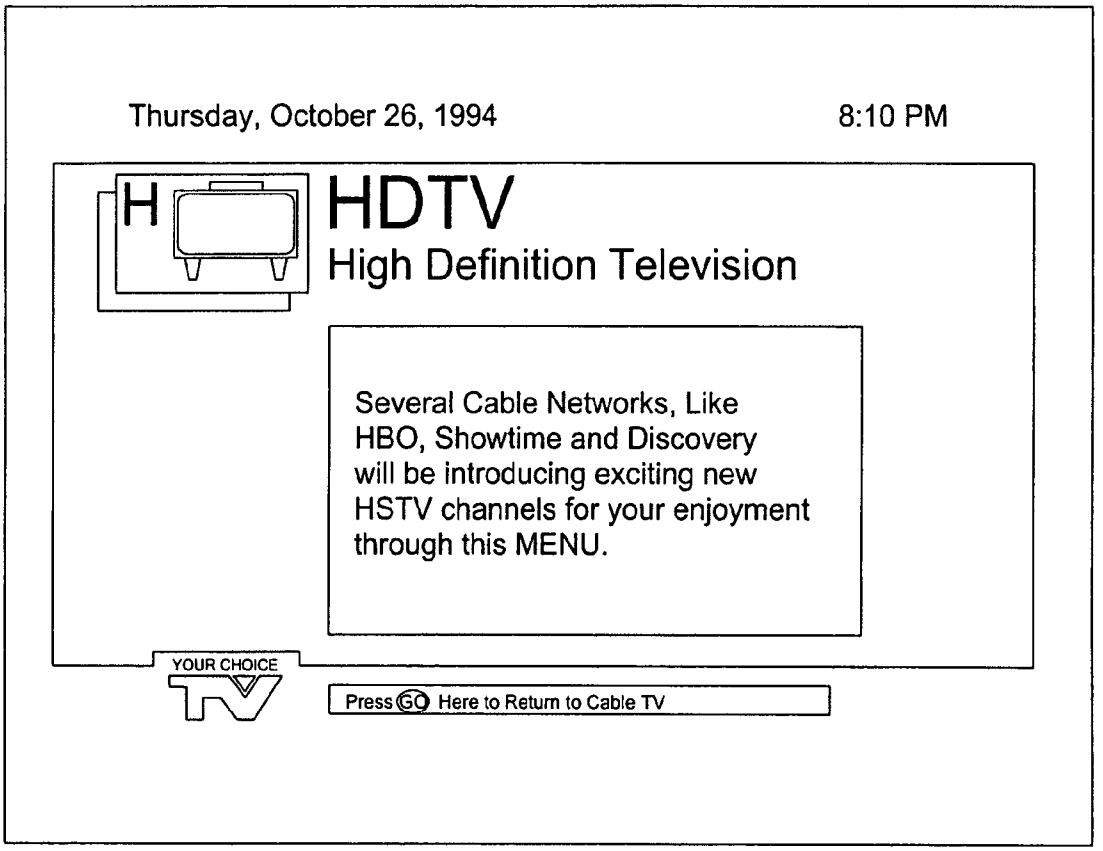

Thursday, October 26, 1994
8:10 PM
H
HDTV
High Definition Television
Several Cable Networks, Like HBO, Showtime and Discovery will be introducing exciting new HSTV channels for your enjoyment through this MENU.
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1032

FIG. 50a

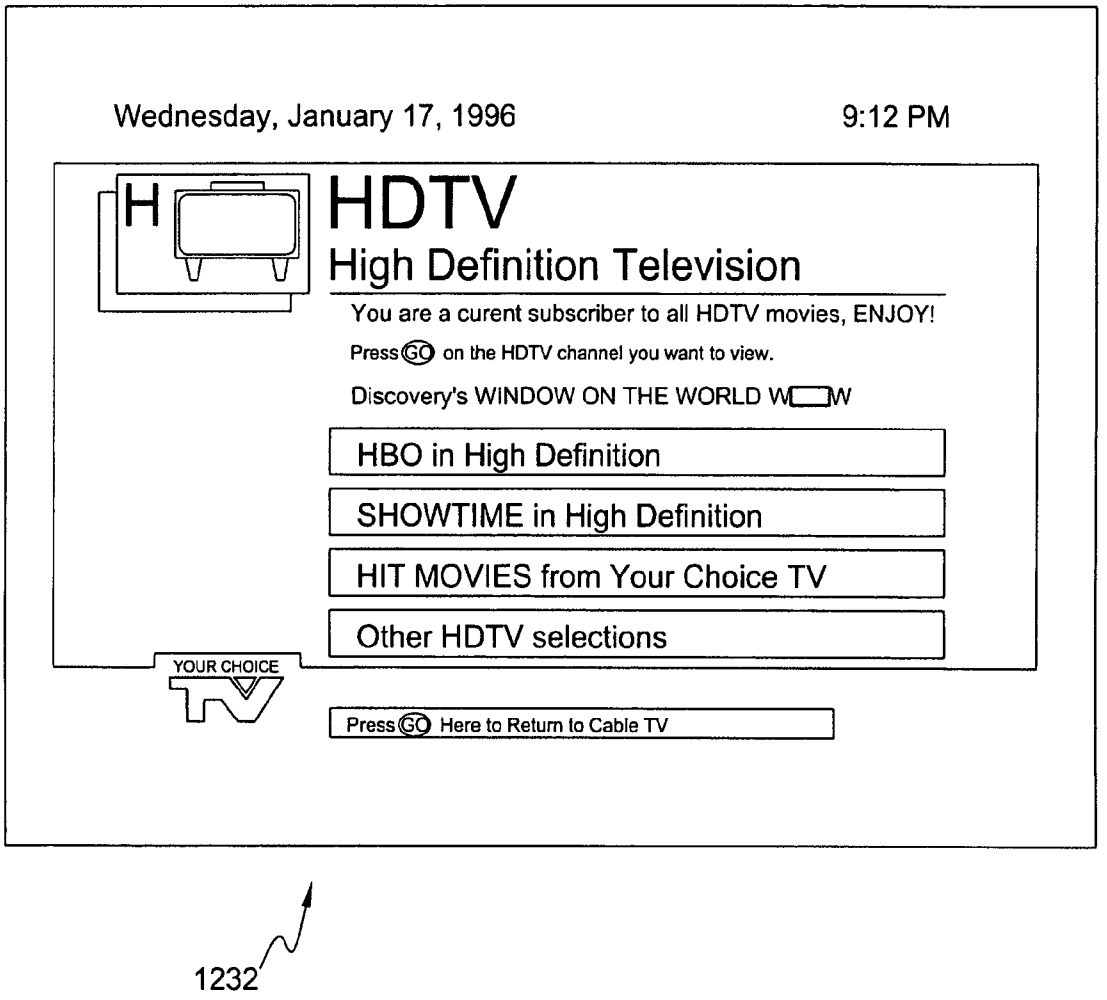
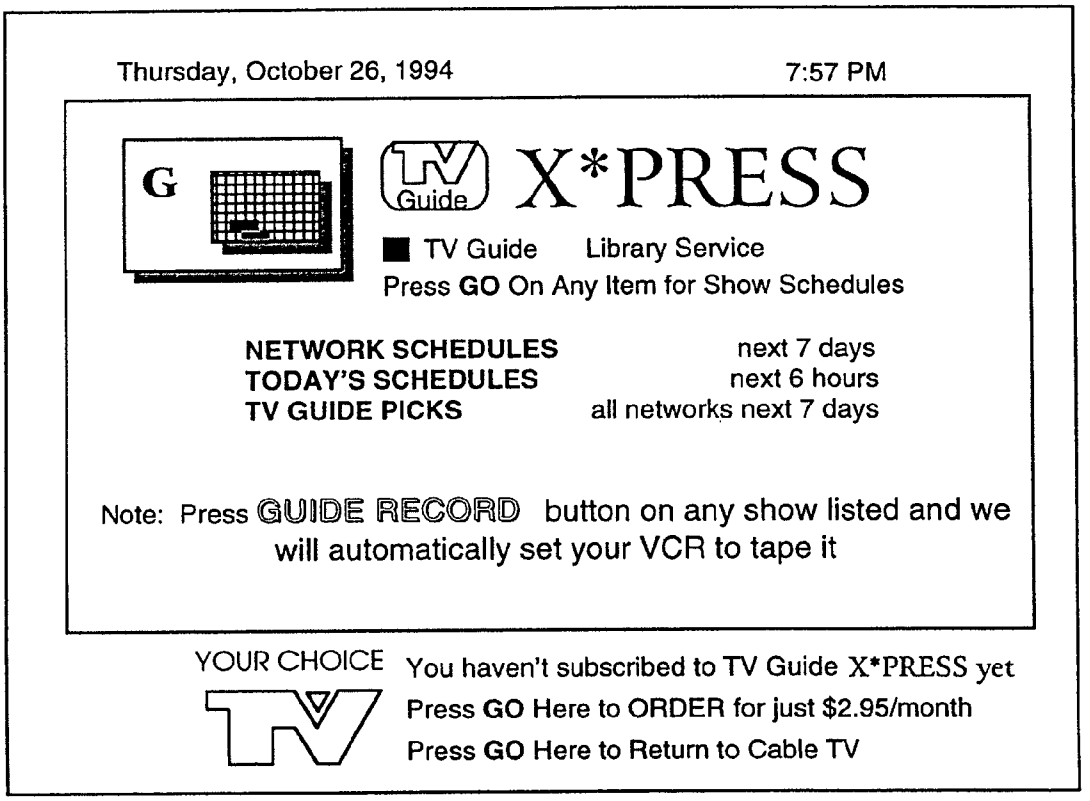

Wednesday, January 17, 1996
9:12 PM
HDTV
High Definition Television
You are a curent subscriber to all HDTV movies, ENJOY!
Press GO on the HDTV channel you want to view.
Discovery's WINDOW ON THE WORLD W W
HBO in High Definition
SHOWTIME in High Definition
HIT MOVIES from Your Choice TV
Other HDTV selections
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1232

FIG. 50b

Fig. 51a


Thursday, October 26, 1994
7:57 PM
G
TV Guide
X*PRESS
TV Guide Library Service
Press GO On Any Item for Show Schedules
NETWORK SCHEDULES
next 7 days
TODAY'S SCHEDULES
next 6 hours
TV GUIDE PICKS
all networks next 7 days
Note: Press GUIDE RECORD button on any show listed and we will automatically set your VCR to tape it
YOUR CHOICE
TV
You haven't subscribed to TV Guide X*PRESS yet
Press GO Here to ORDER for just $2.95/month
Press GO Here to Return to Cable TV

1036

Fig. 51b

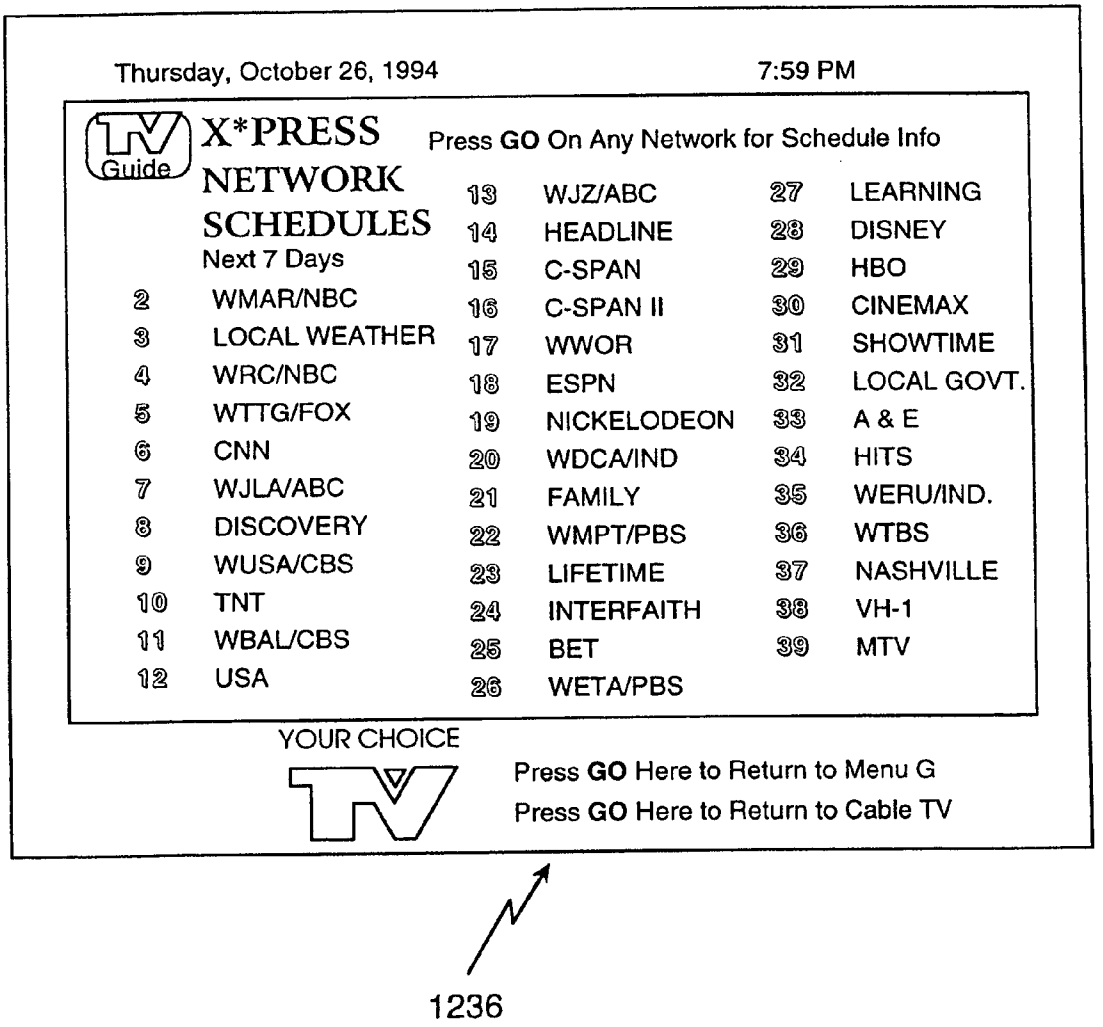

Thursday, October 26, 1994
7:59 PM
TV Guide
X*PRESS NETWORK SCHEDULES
Next 7 Days
Press GO On Any Network for Schedule Info
2 WMAR/NBC
3 LOCAL WEATHER
4 WRC/NBC
5 WTTG/FOX
6 CNN
7 WJLA/ABC
8 DISCOVERY
9 WUSA/CBS
10 TNT
11 WBAL/CBS
12 USA
13 WJZ/ABC
14 HEADLINE
15 C-SPAN
16 C-SPAN II
17 WWOR
18 ESPN
19 NICKELODEON
20 WDCA/IND
21 FAMILY
22 WMPT/PBS
23 LIFETIME
24 INTERFAITH
25 BET
26 WETA/PBS
27 LEARNING
28 DISNEY
29 HBO
30 CINEMAX
31 SHOWTIME
32 LOCAL GOVT.
33 A & E
34 HITS
35 WERU/IND.
36 WTBS
37 NASHVILLE
38 VH-1
39 MTV
YOUR CHOICE
TV
Press GO Here to Return to Menu G
Press GO Here to Return to Cable TV
1236

Fig. 51c

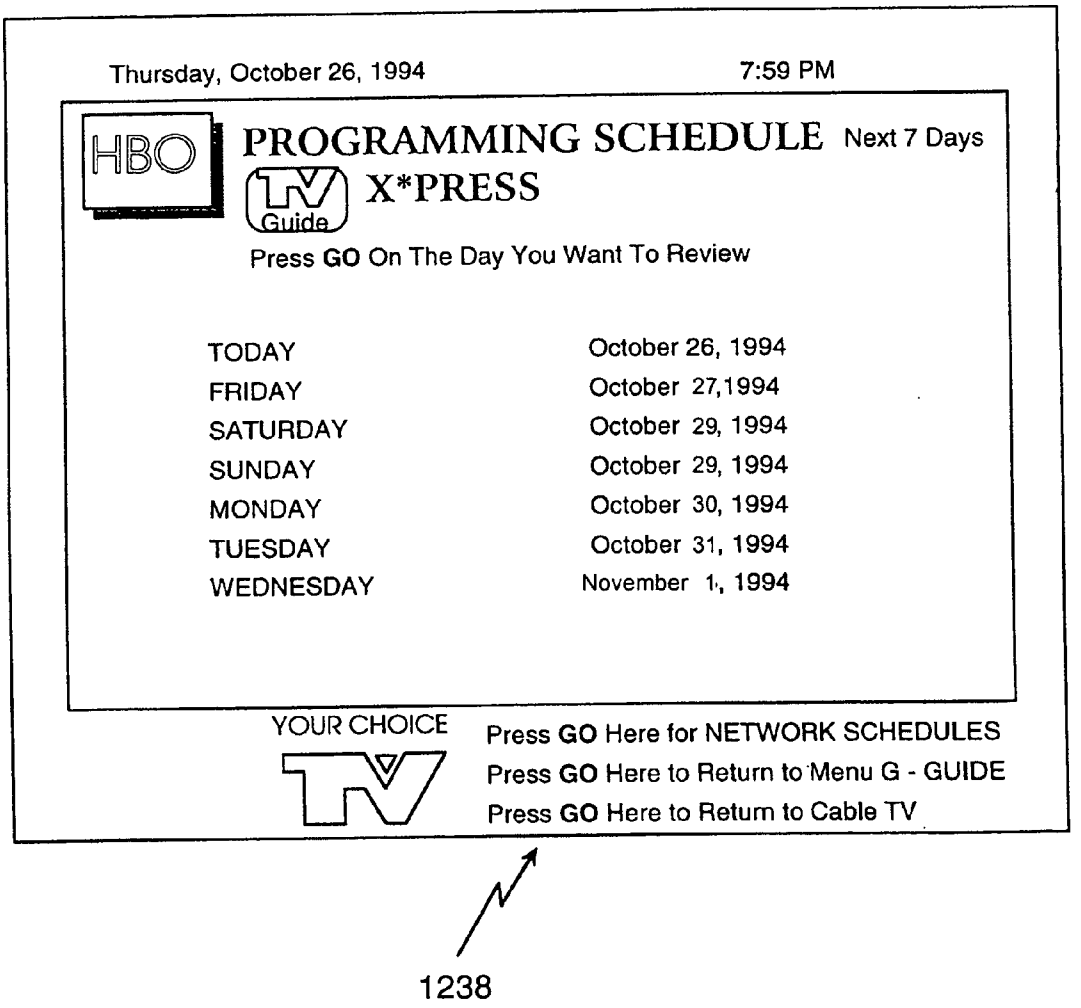

Thursday, October 26, 1994
7:59 PM
HBO
PROGRAMMING SCHEDULE
Next 7 Days
TV Guide
X*PRESS
Press GO On The Day You Want To Review
TODAY
October 26, 1994
FRIDAY
October 27,1994
SATURDAY
October 29, 1994
SUNDAY
October 29, 1994
MONDAY
October 30, 1994
TUESDAY
October 31, 1994
WEDNESDAY
November 1, 1994
YOUR CHOICE
TV
Press GO Here for NETWORK SCHEDULES
Press GO Here to Return to Menu G - GUIDE
Press GO Here to Retum to Cable TV
1238

Fig. 51d

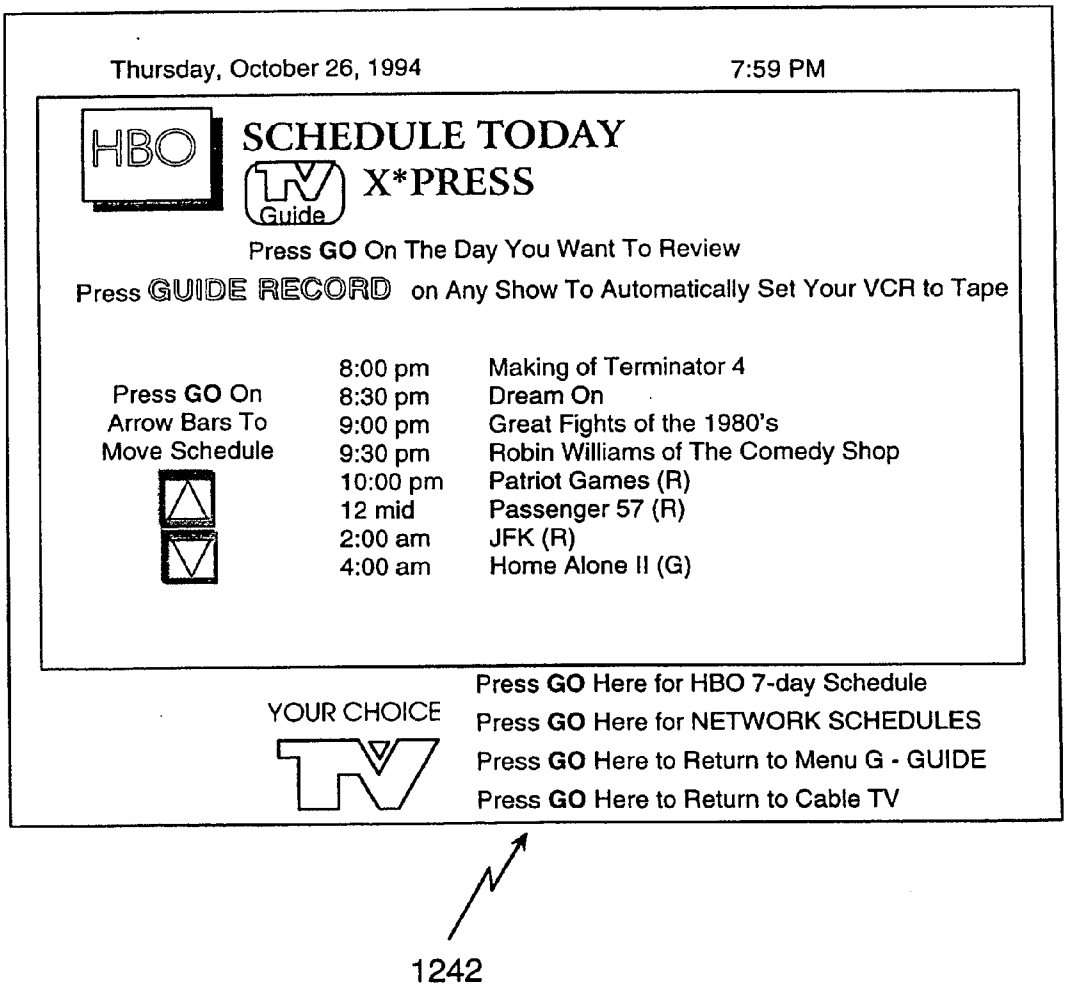
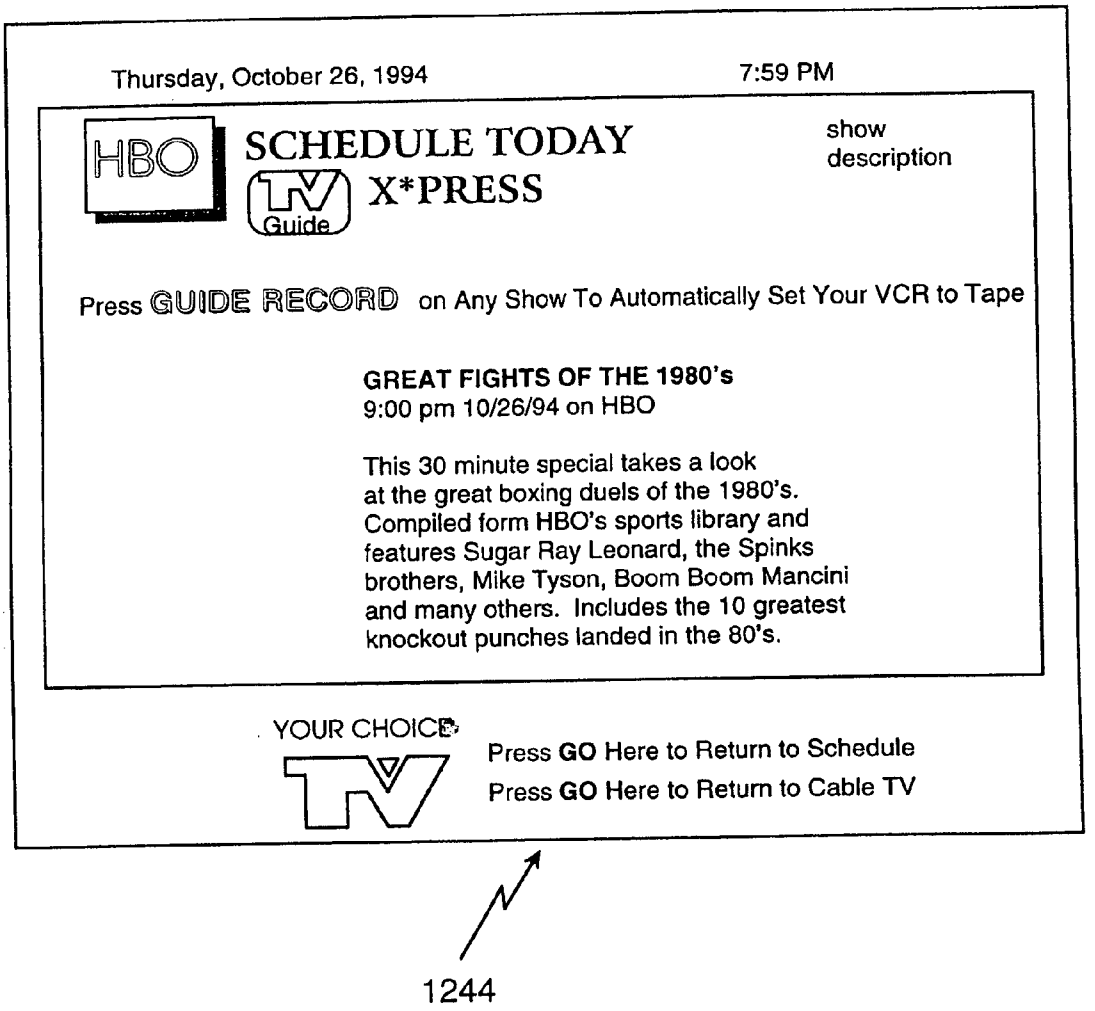

Thursday, October 26, 1994
7:59 PM
HBO
SCHEDULE TODAY
TV Guide X*PRESS
Press GO On The Day You Want To Review
Press GUIDE RECORD on Any Show To Automatically Set Your VCR to Tape
Press GO On Arrow Bars To Move Schedule
8:00 pm Making of Terminator 4
8:30 pm Dream On
9:00 pm Great Fights of the 1980's
9:30 pm Robin Williams of The Comedy Shop
10:00 pm Patriot Games (R)
12 mid Passenger 57 (R)
2:00 am JFK (R)
4:00 am Home Alone II (G)
YOUR CHOICE
TV
Press GO Here for HBO 7-day Schedule
Press GO Here for NETWORK SCHEDULES
Press GO Here to Return to Menu G - GUIDE
Press GO Here to Return to Cable TV
1242

Fig. 51e


Thursday, October 26, 1994
7:59 PM
HBO
SCHEDULE TODAY
TV Guide
X*PRESS
show description
Press GUIDE RECORD on Any Show To Automatically Set Your VCR to Tape
GREAT FIGHTS OF THE 1980's
9:00 pm 10/26/94 on HBO
This 30 minute special takes a look at the great boxing duels of the 1980's. Compiled form HBO's sports library and features Sugar Ray Leonard, the Spinks brothers, Mike Tyson, Boom Boom Mancini and many others. Includes the 10 greatest knockout punches landed in the 80's.
YOUR CHOICE
TV
Press GO Here to Return to Schedule
Press GO Here to Return to Cable TV
1244

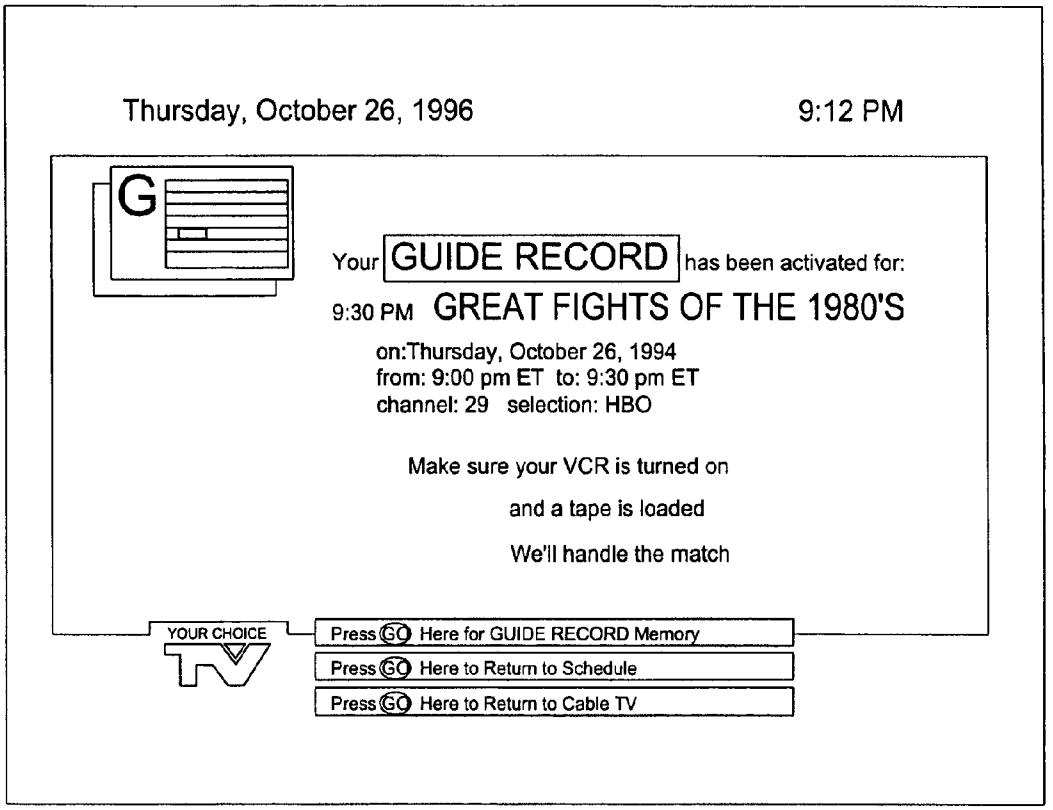

Thursday, October 26, 1996
9:12 PM
G
Your GUIDE RECORD has been activated for:
9:30 PM GREAT FIGHTS OF THE 1980'S
on:Thursday, October 26, 1994
from: 9:00 pm ET to: 9:30 pm ET
channel: 29 selection: HBO
Make sure your VCR is turned on
and a tape is loaded
We'll handle the match
YOUR CHOICE TV
Press GO Here for GUIDE RECORD Memory
Press GO Here to Return to Schedule
Press GO Here to Return to Cable TV
1248

FIG. 51f

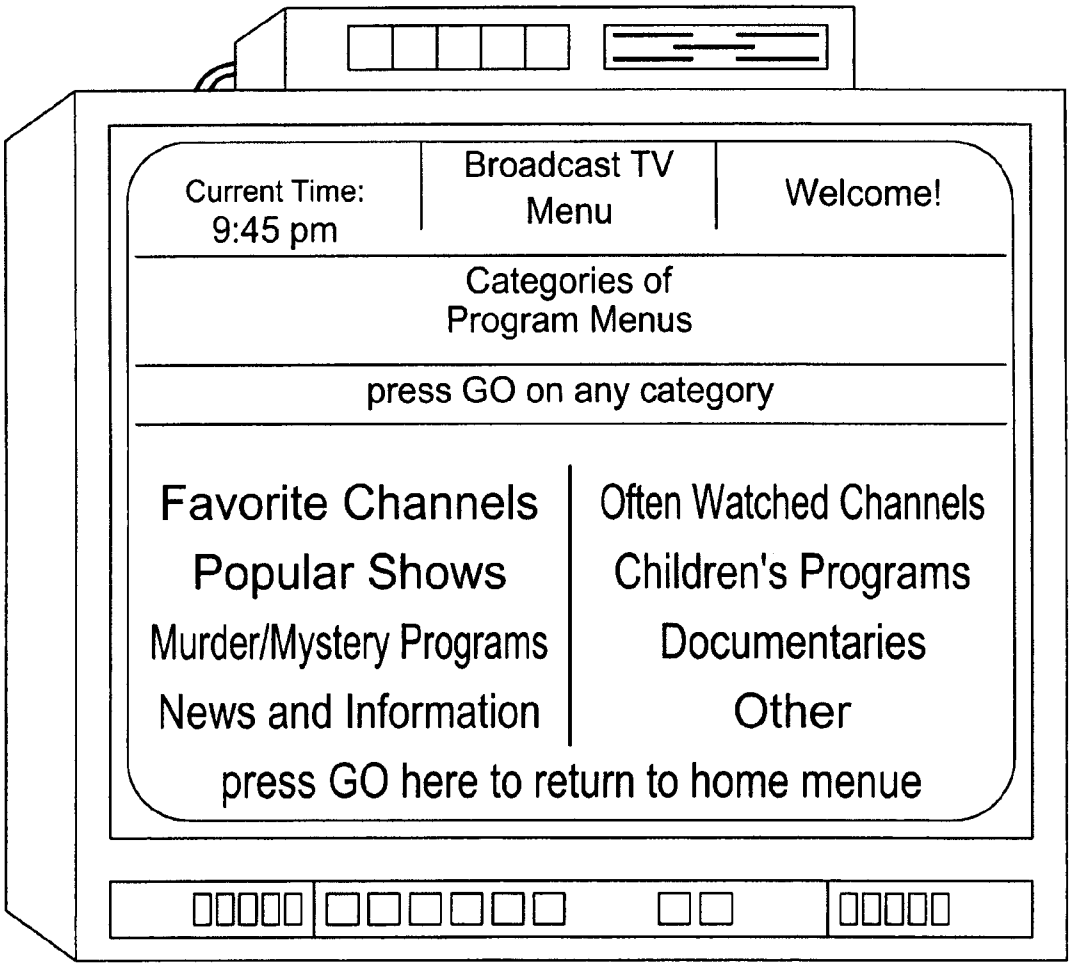

Current Time:
9:45 pm
Broadcast TV
Menu
Welcome!
Categories of
Program Menus
press GO on any category
Favorite Channels
Popular Shows
Murder/Mystery Programs
News and Information
Often Watched Channels
Children's Programs
Documentaries
Other
press GO here to return to home menue
1046

FIG. 51g

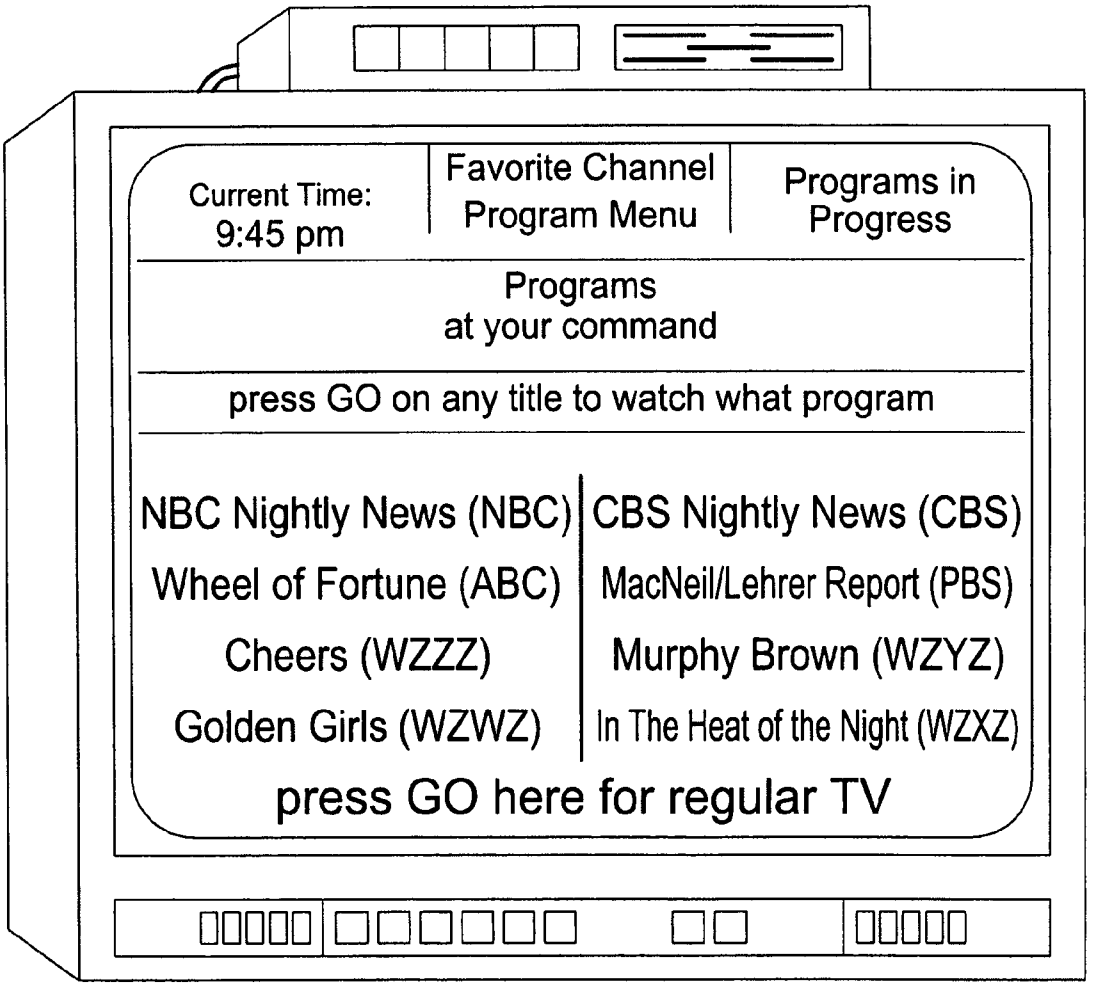

Current Time:
9:45 pm
Favorite Channel
Program Menu
Programs in
Progress
Programs
at your command
press GO on any title to watch what program
NBC Nightly News (NBC)
CBS Nightly News (CBS)
Wheel of Fortune (ABC)
MacNeil/Lehrer Report (PBS)
Cheers (WZZZ)
Murphy Brown (WZYZ)
Golden Girls (WZWZ)
In The Heat of the Night (WZXZ)
press GO here for regular TV
1256

FIG. 51h

MOOD QUESTION MENUS

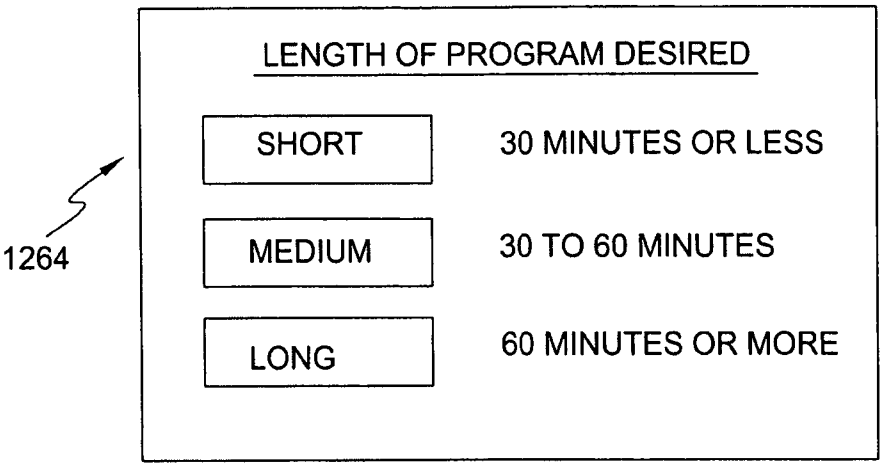


FIG 51i

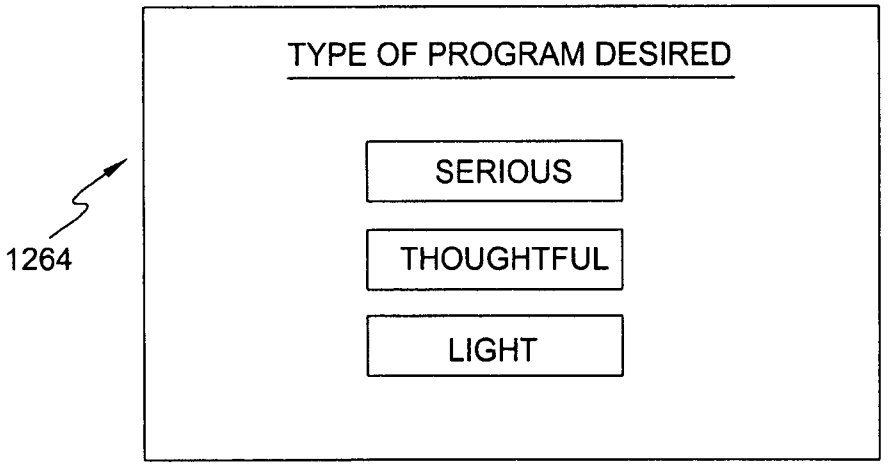


FIG 51j

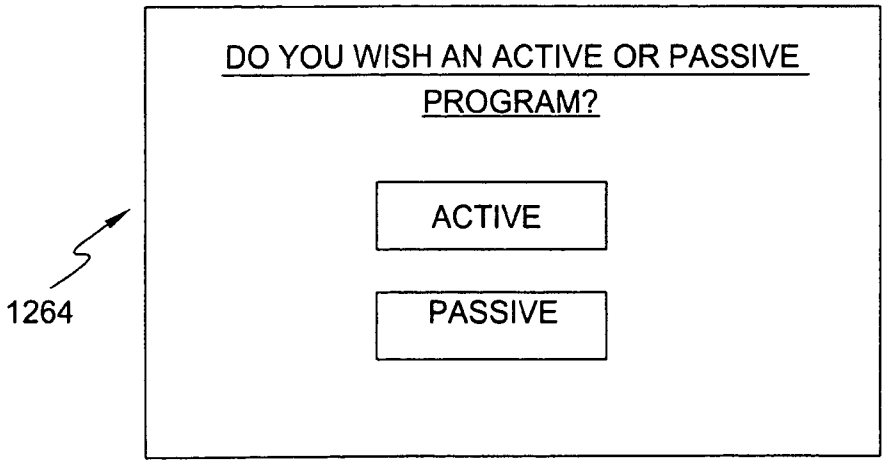


FIG 51k

Fig. 52a

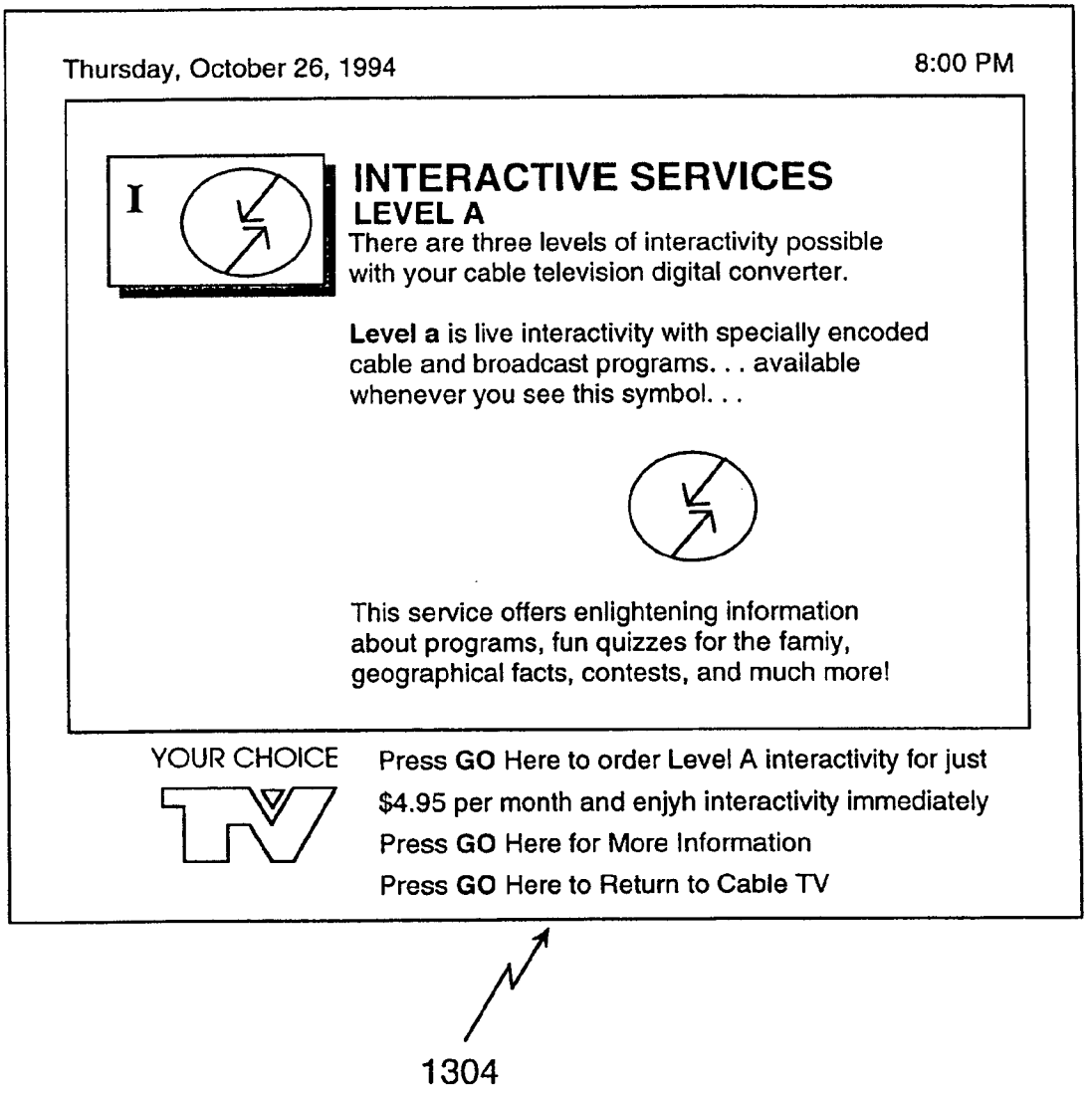

Thursday, October 26, 1994
8:00 PM
I
INTERACTIVE SERVICES
LEVEL A
There are three levels of interactivity possible with your cable television digital converter.
Level a is live interactivity with specially encoded cable and broadcast programs. . . available whenever you see this symbol. . .
This service offers enlightening information about programs, fun quizzes for the famiy, geographical facts, contests, and much more!
YOUR CHOICE
TV
Press GO Here to order Level A interactivity for just $4.95 per month and enjyh interactivity immediately
Press GO Here for More Information
Press GO Here to Return to Cable TV
1304

Fig. 52b

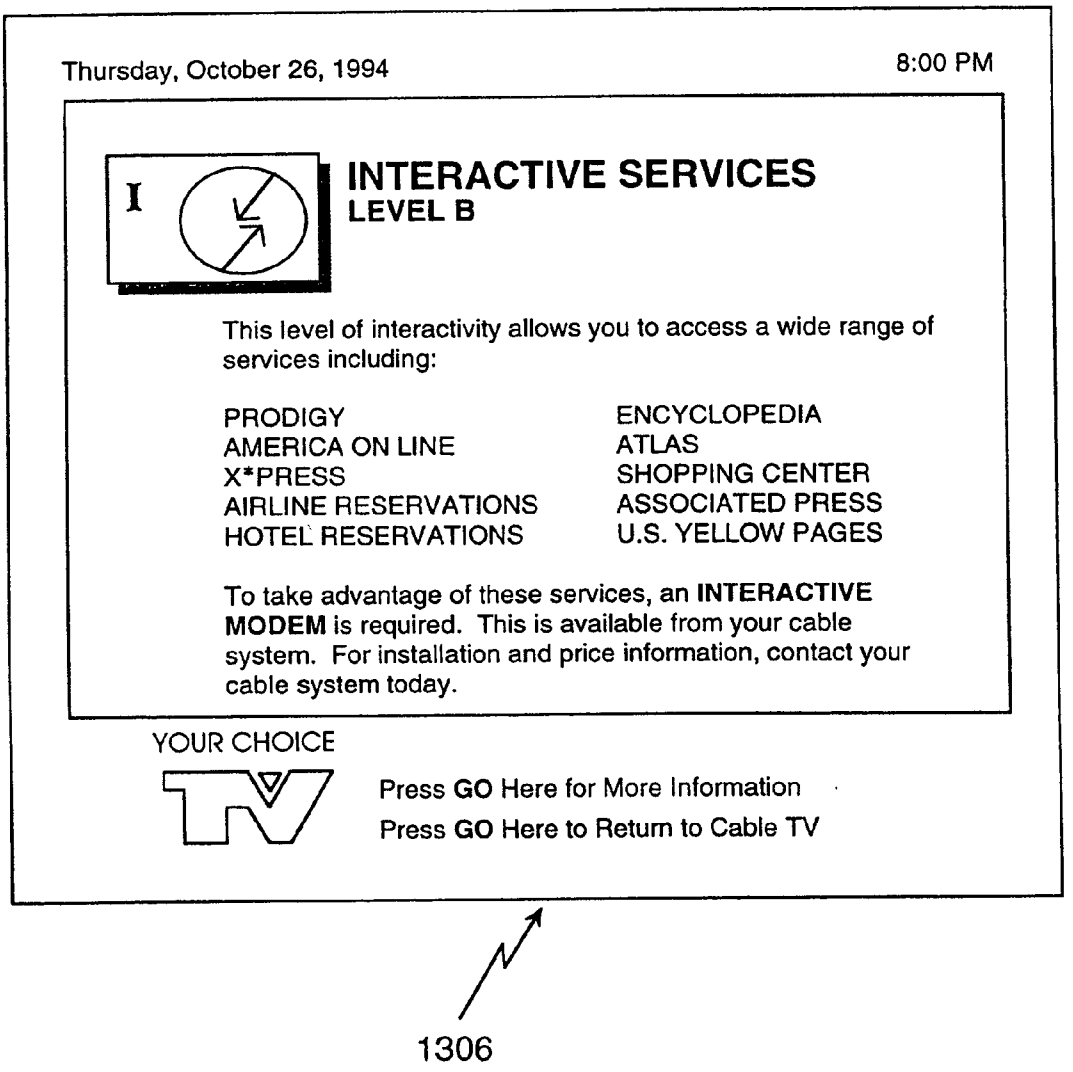

Thursday, October 26, 1994
8:00 PM
I
INTERACTIVE SERVICES
LEVEL B
This level of interactivity allows you to access a wide range of services including:
PRODIGY
AMERICA ON LINE
X*PRESS
AIRLINE RESERVATIONS
HOTEL RESERVATIONS
ENCYCLOPEDIA
ATLAS
SHOPPING CENTER
ASSOCIATED PRESS
U.S. YELLOW PAGES
To take advantage of these services, an INTERACTIVE MODEM is required. This is available from your cable system. For installation and price information, contact your cable system today.
YOUR CHOICE
TV
Press GO Here for More Information
Press GO Here to Return to Cable TV
1306

Fig. 52c

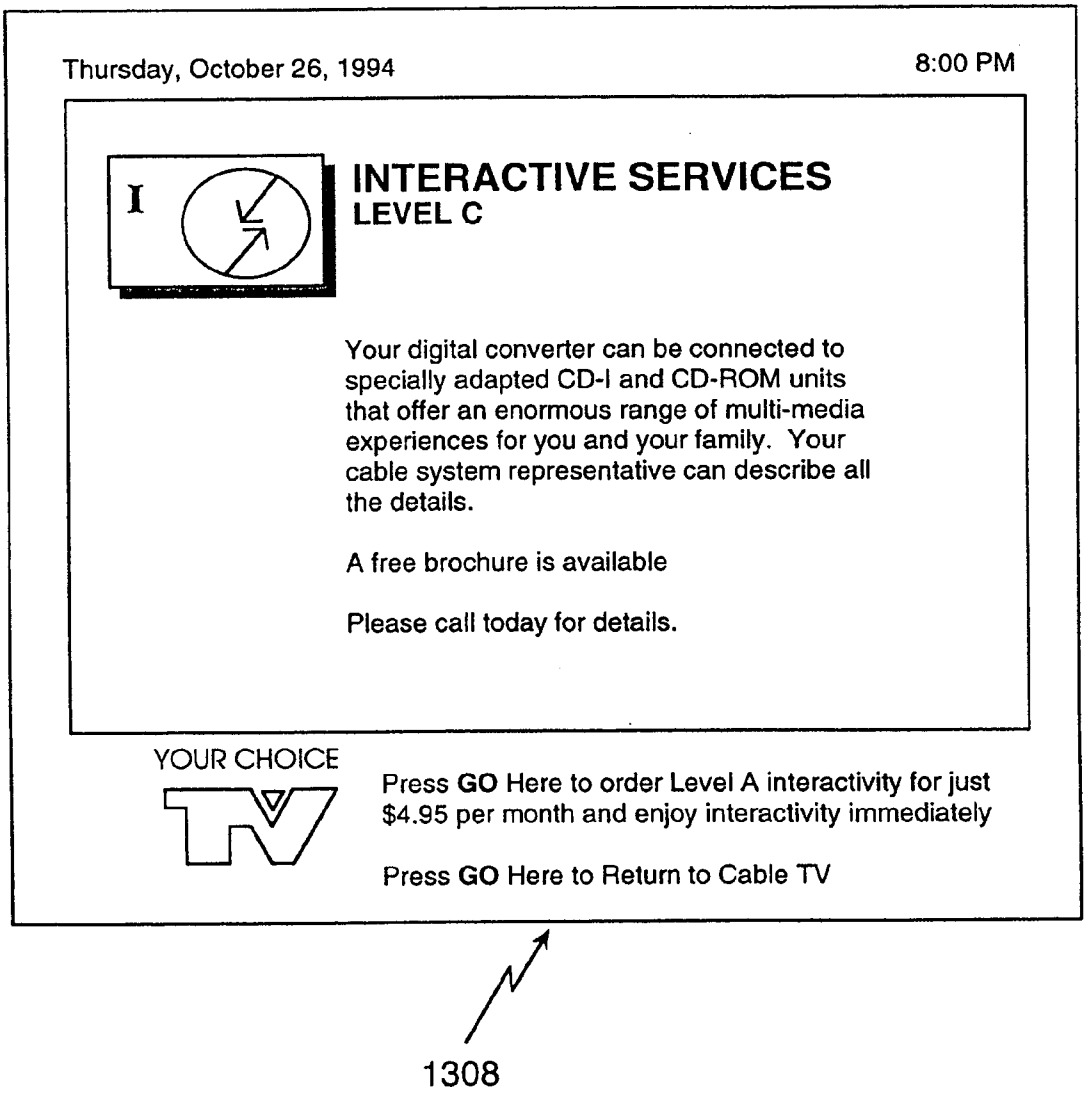

Thursday, October 26, 1994
8:00 PM
I
INTERACTIVE SERVICES
LEVEL C
Your digital converter can be connected to specially adapted CD-I and CD-ROM units that offer an enormous range of multi-media experiences for you and your family. Your cable system representative can describe all the details.
A free brochure is available
Please call today for details.
YOUR CHOICE
TV
Press GO Here to order Level A interactivity for just $4.95 per month and enjoy interactivity immediately
Press GO Here to Return to Cable TV
1308

Fig. 52d

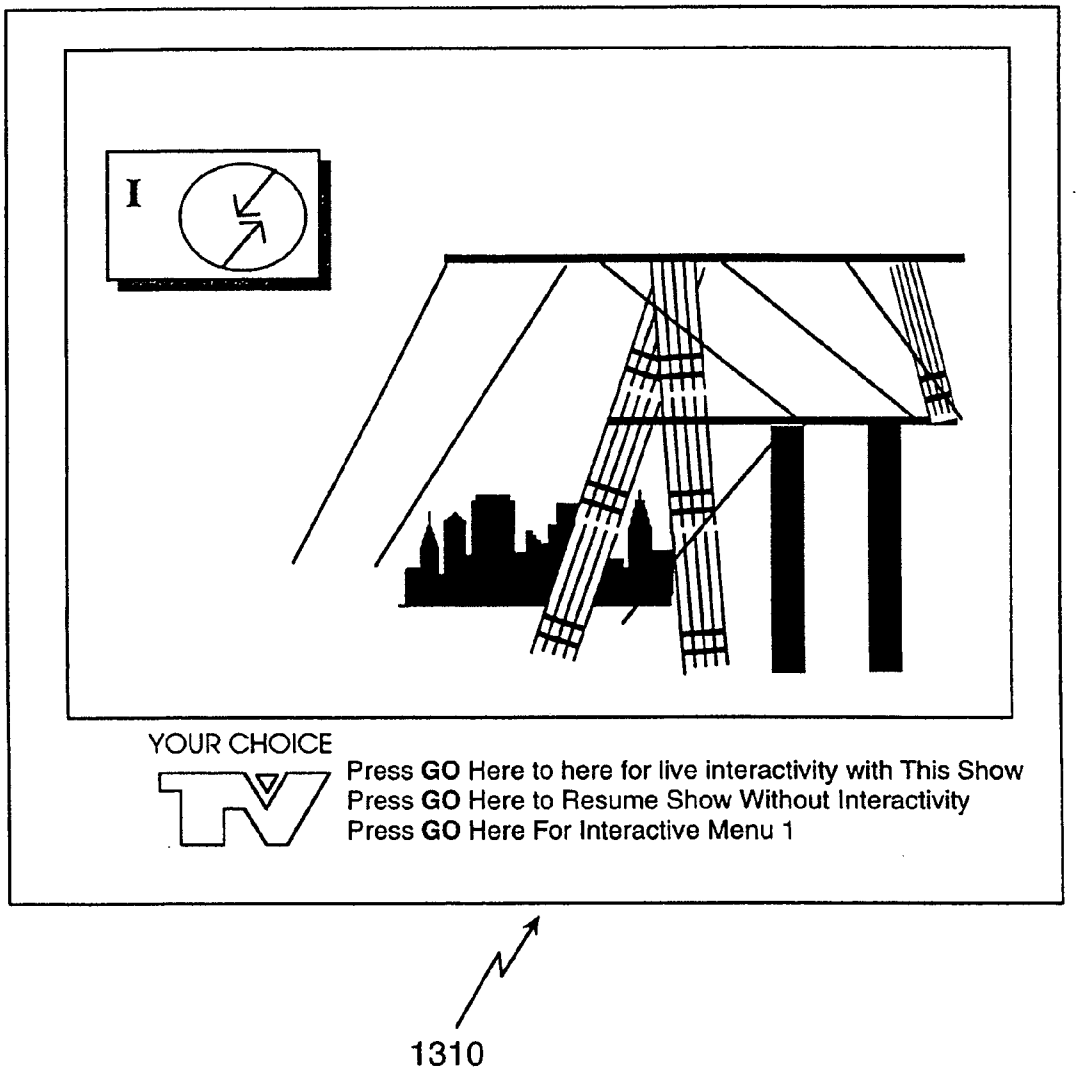

I
YOUR CHOICE
Press GO Here to here for live interactivity with This Show
Press GO Here to Resume Show Without Interactivity
Press GO Here For Interactive Menu 1
1310

Fig. 52e

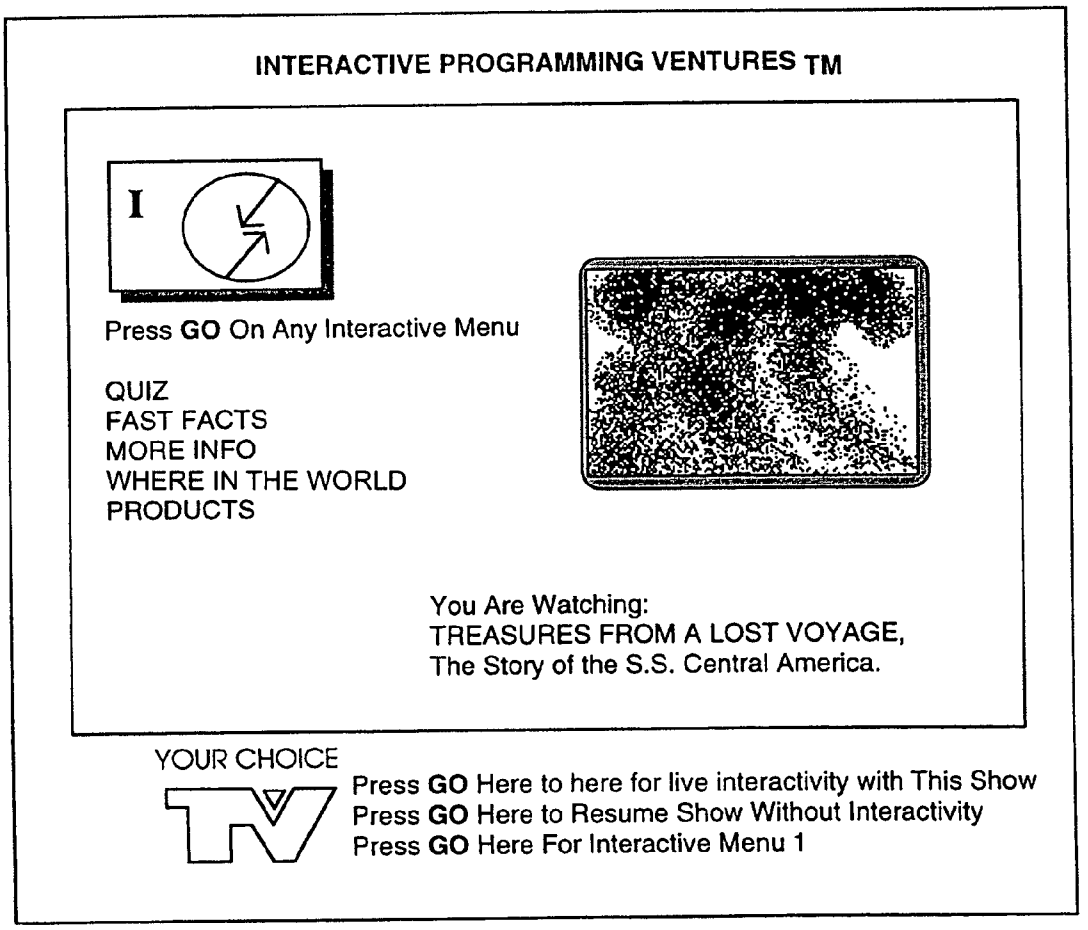

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO On Any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
You Are Watching:
TREASURES FROM A LOST VOYAGE,
The Story of the S.S. Central America.
YOUR CHOICE
Press GO Here to here for live interactivity with This Show
Press GO Here to Resume Show Without Interactivity
Press GO Here For Interactive Menu 1
1312

Fig.52f

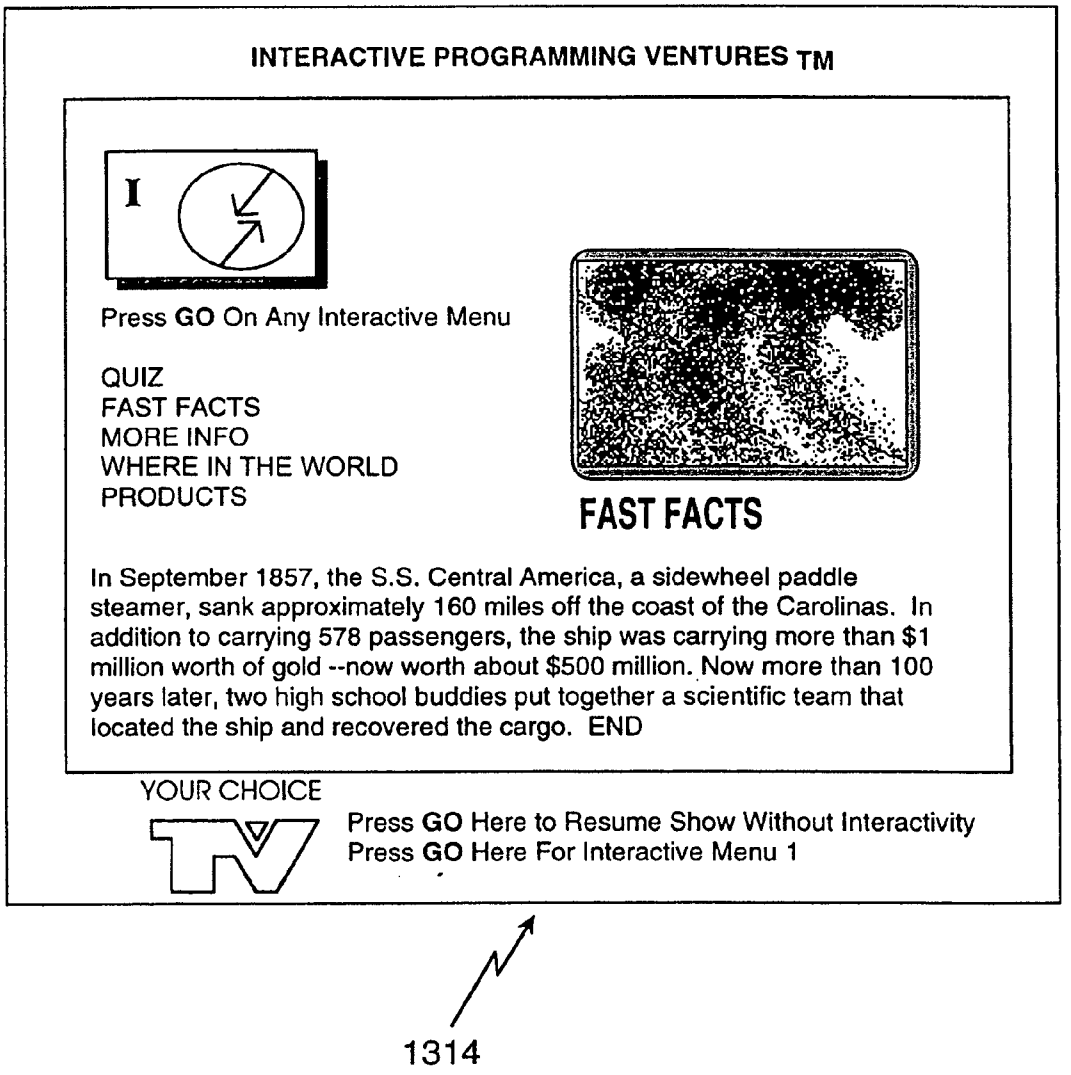

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO On Any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
FAST FACTS
In September 1857, the S.S. Central America, a sidewheel paddle steamer, sank approximately 160 miles off the coast of the Carolinas. In addition to carrying 578 passengers, the ship was carrying more than $1 million worth of gold --now worth about $500 million. Now more than 100 years later, two high school buddies put together a scientific team that located the ship and recovered the cargo. END
YOUR CHOICE
TV
Press GO Here to Resume Show Without Interactivity
Press GO Here For Interactive Menu 1
1314

Fig. 52g

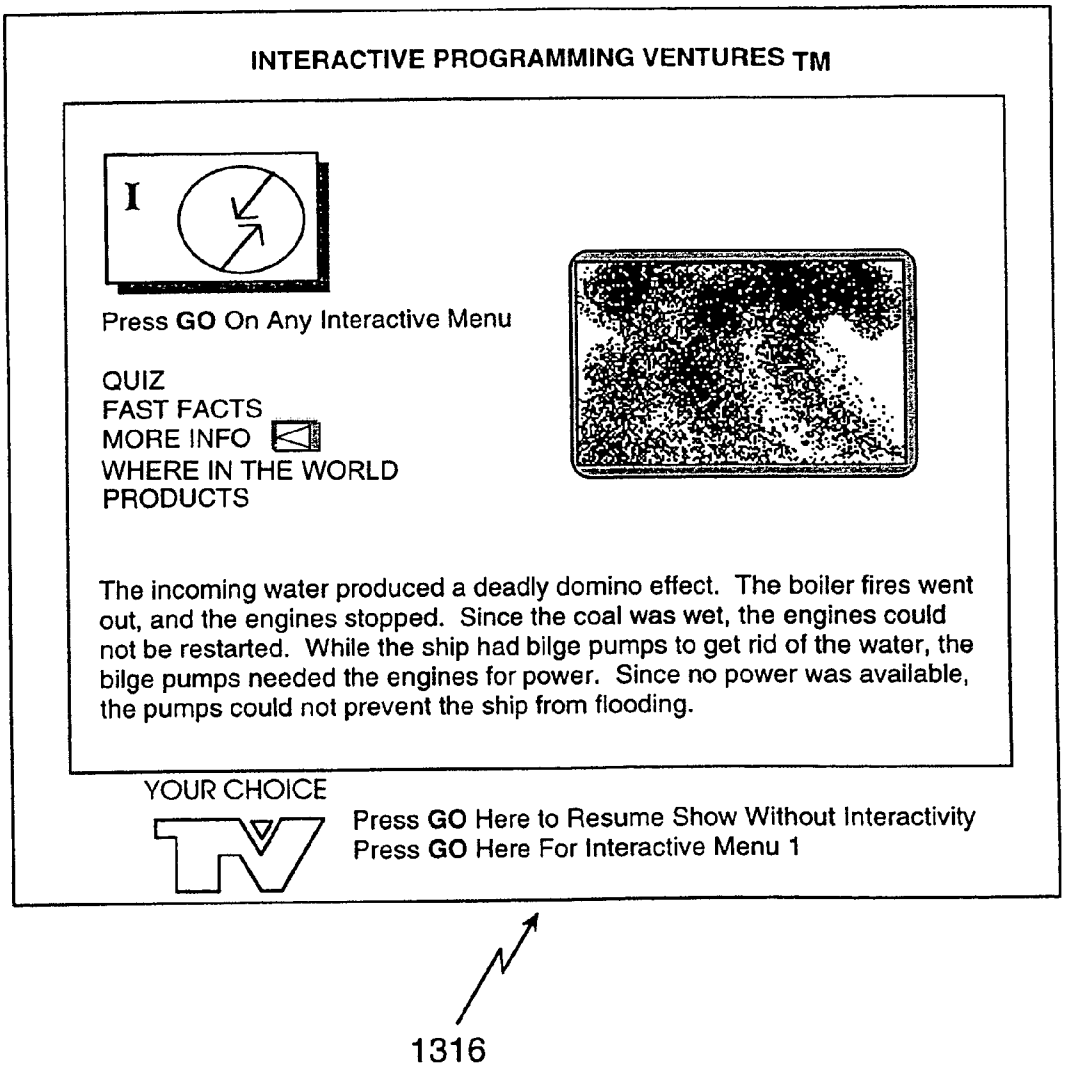

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO On Any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
The incoming water produced a deadly domino effect. The boiler fires went out, and the engines stopped. Since the coal was wet, the engines could not be restarted. While the ship had bilge pumps to get rid of the water, the bilge pumps needed the engines for power. Since no power was available, the pumps could not prevent the ship from flooding.
YOUR CHOICE
Press GO Here to Resume Show Without Interactivity
Press GO Here For Interactive Menu 1
1316

Fig. 52h

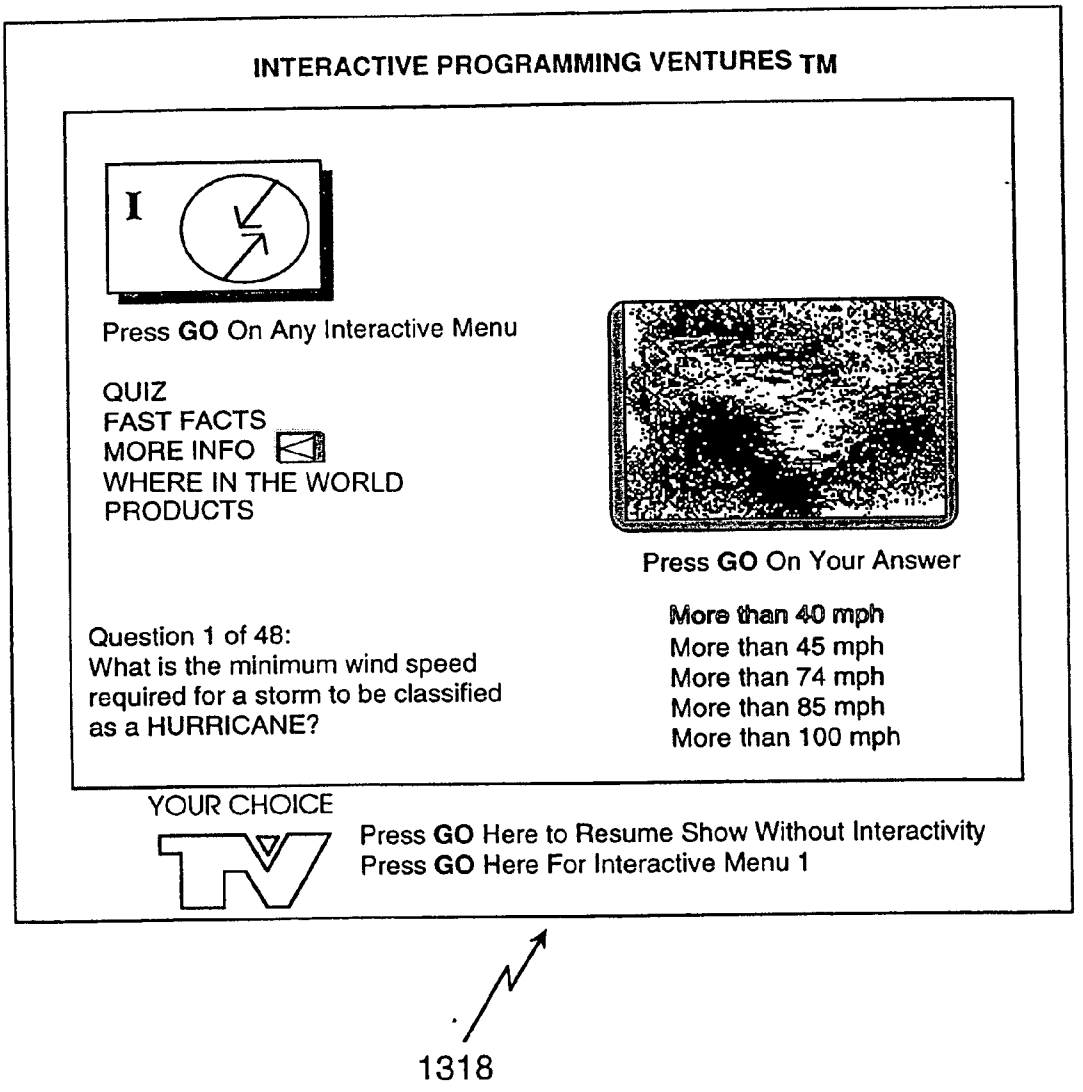

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO On Any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
Press GO On Your Answer
Question 1 of 48:
What is the minimum wind speed required for a storm to be classified as a HURRICANE?
More than 40 mph
More than 45 mph
More than 74 mph
More than 85 mph
More than 100 mph
YOUR CHOICE
Press GO Here to Resume Show Without Interactivity
Press GO Here For Interactive Menu 1
1318

Fig. 52i

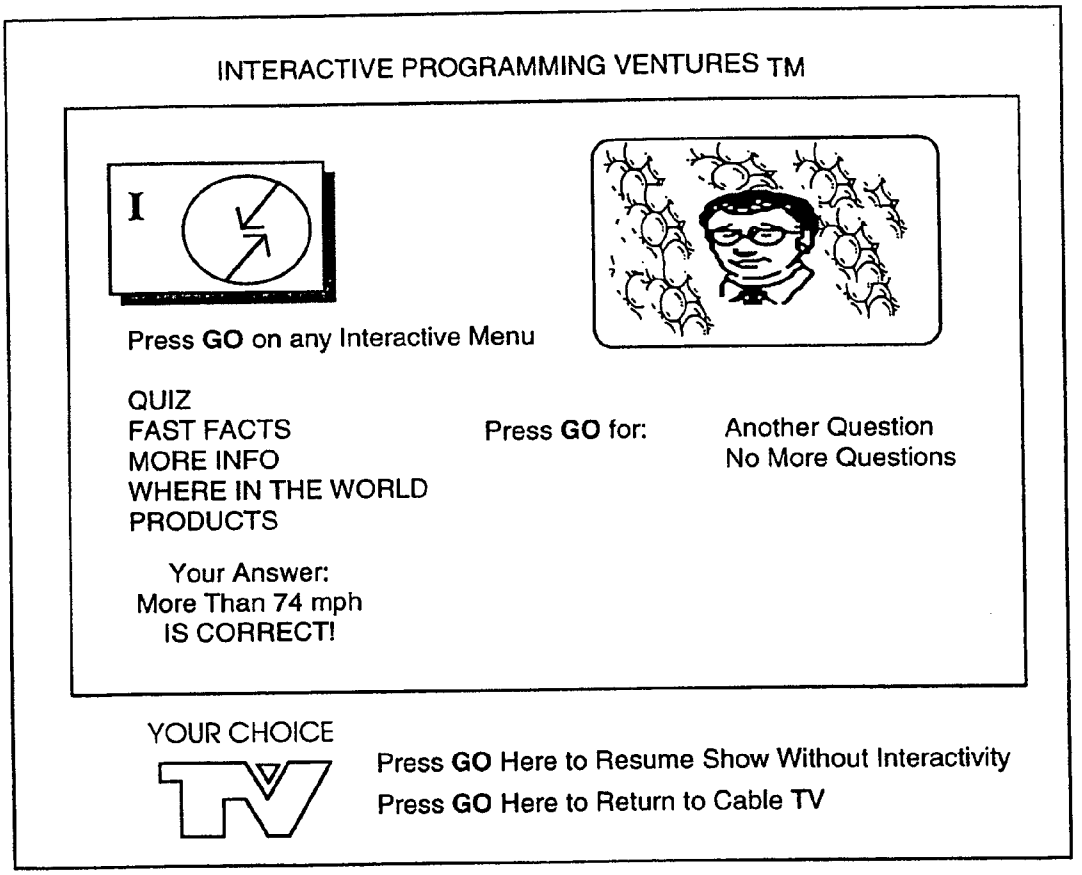

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO on any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
Press GO for:
Another Question
No More Questions
Your Answer:
More Than 74 mph
IS CORRECT!
YOUR CHOICE
TV
Press GO Here to Resume Show Without Interactivity
Press GO Here to Return to Cable TV
1320

Fig. 52j

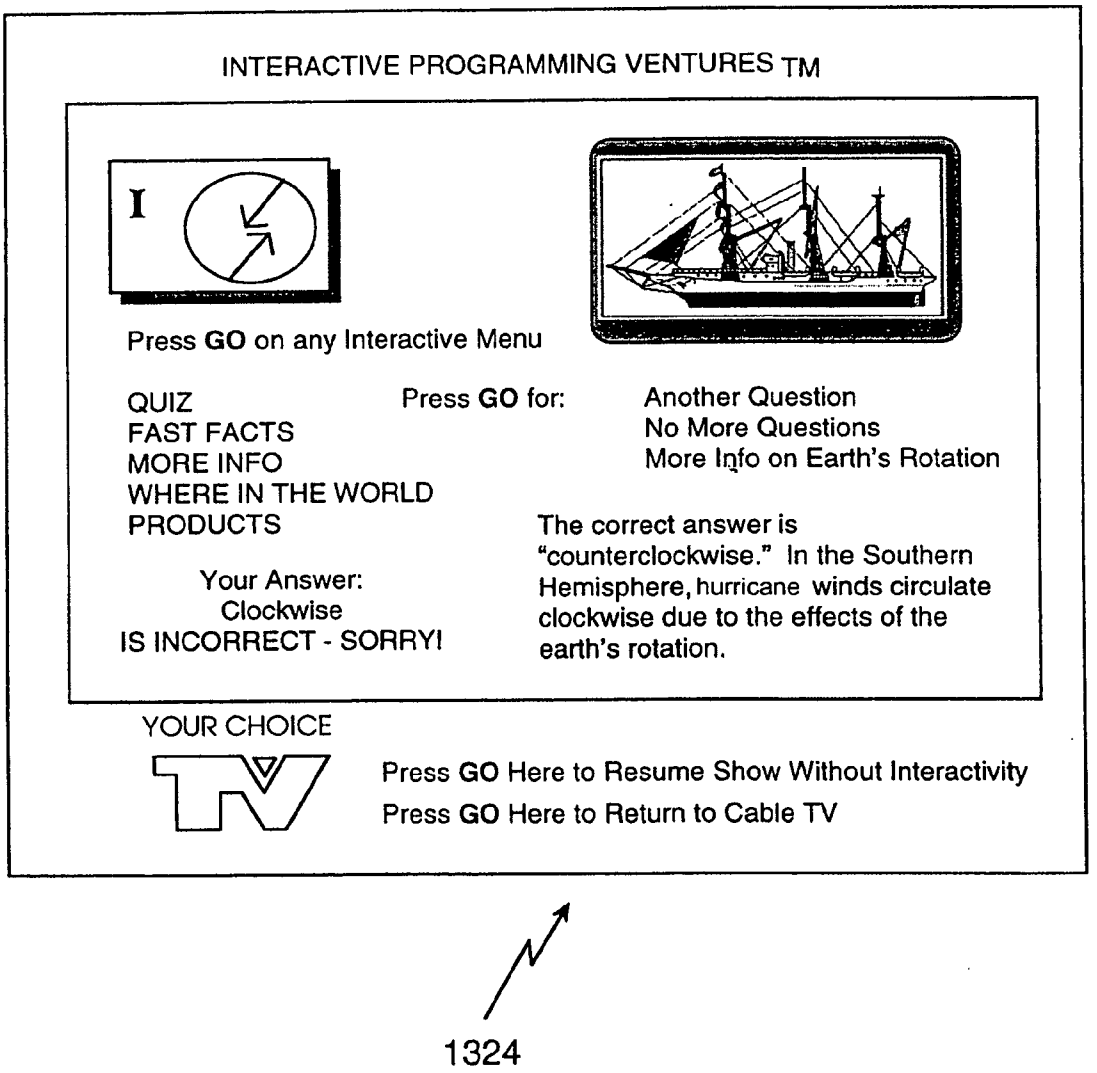

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO on any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
Press GO for:
Another Question
No More Questions
More Info on Earth's Rotation
Your Answer:
Clockwise
IS INCORRECT - SORRY!
The correct answer is "counterclockwise." In the Southern Hemisphere, hurricane winds circulate clockwise due to the effects of the earth's rotation.
YOUR CHOICE
Press GO Here to Resume Show Without Interactivity
Press GO Here to Return to Cable TV
1324

Fig. 53a

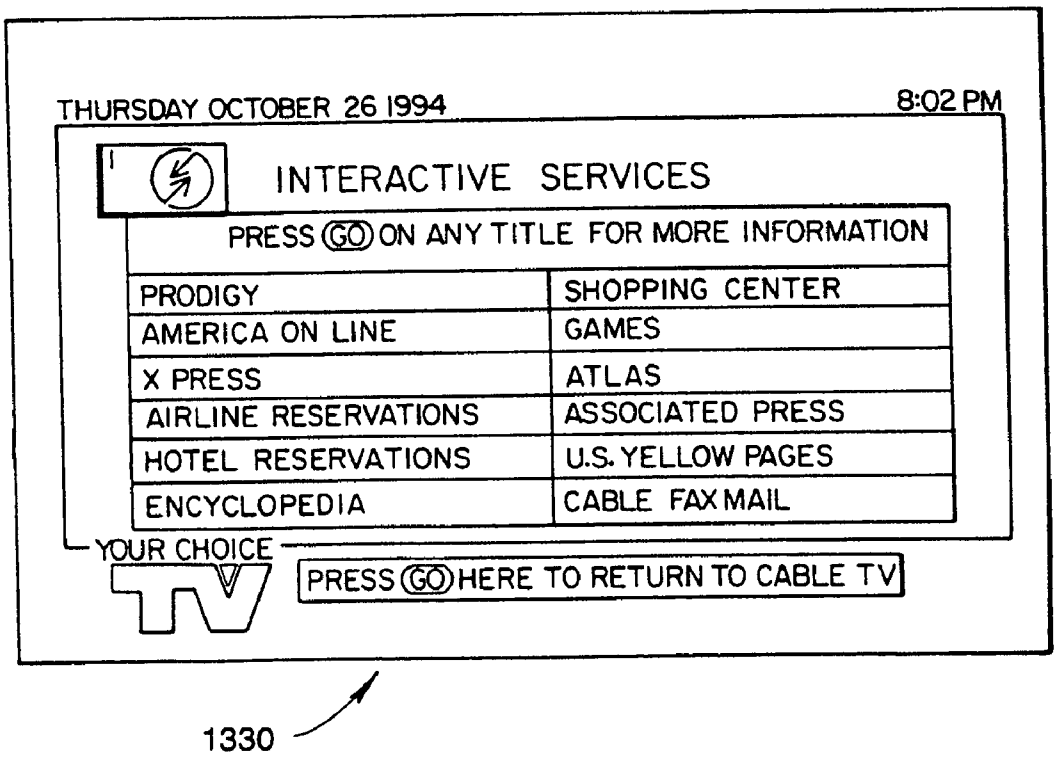

THURSDAY OCTOBER 26 1994
8:02 PM
INTERACTIVE SERVICES
PRESS GO ON ANY TITLE FOR MORE INFORMATION
PRODIGY
SHOPPING CENTER
AMERICA ON LINE
GAMES
X PRESS
ATLAS
AIRLINE RESERVATIONS
ASSOCIATED PRESS
HOTEL RESERVATIONS
U.S. YELLOW PAGES
ENCYCLOPEDIA
CABLE FAX MAIL
YOUR CHOICE
PRESS GO HERE TO RETURN TO CABLE TV
1330

Fig. 53b

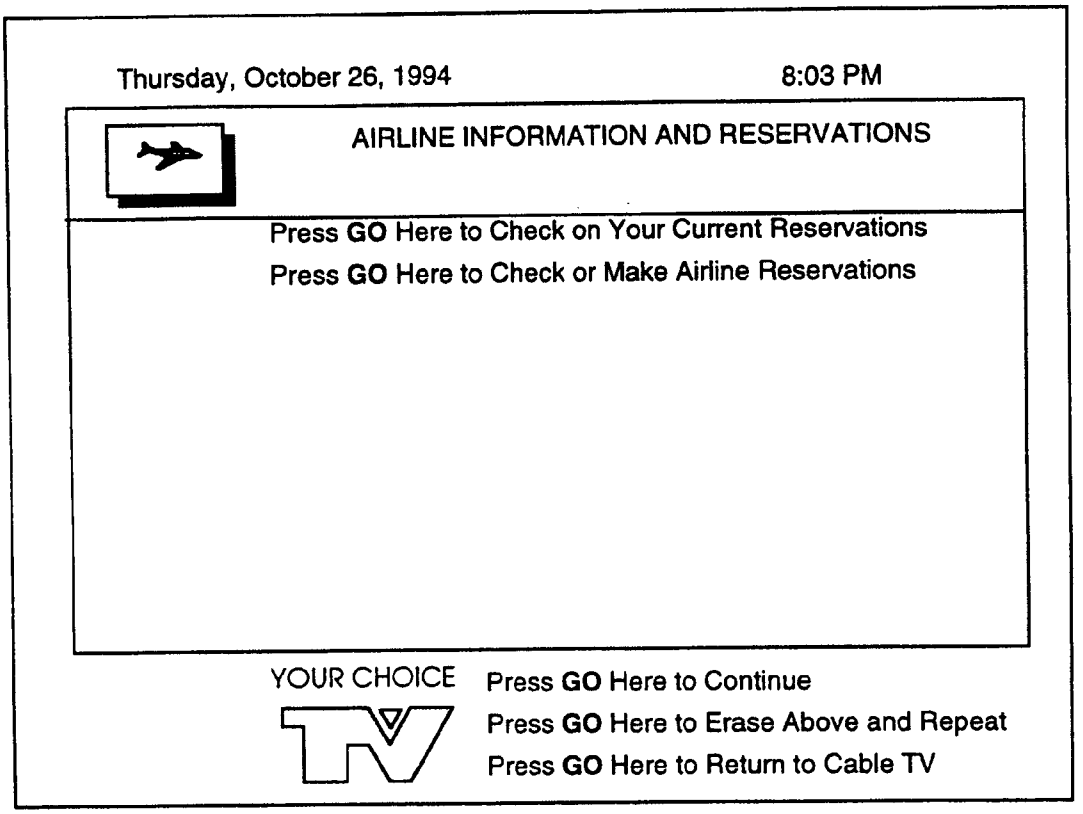
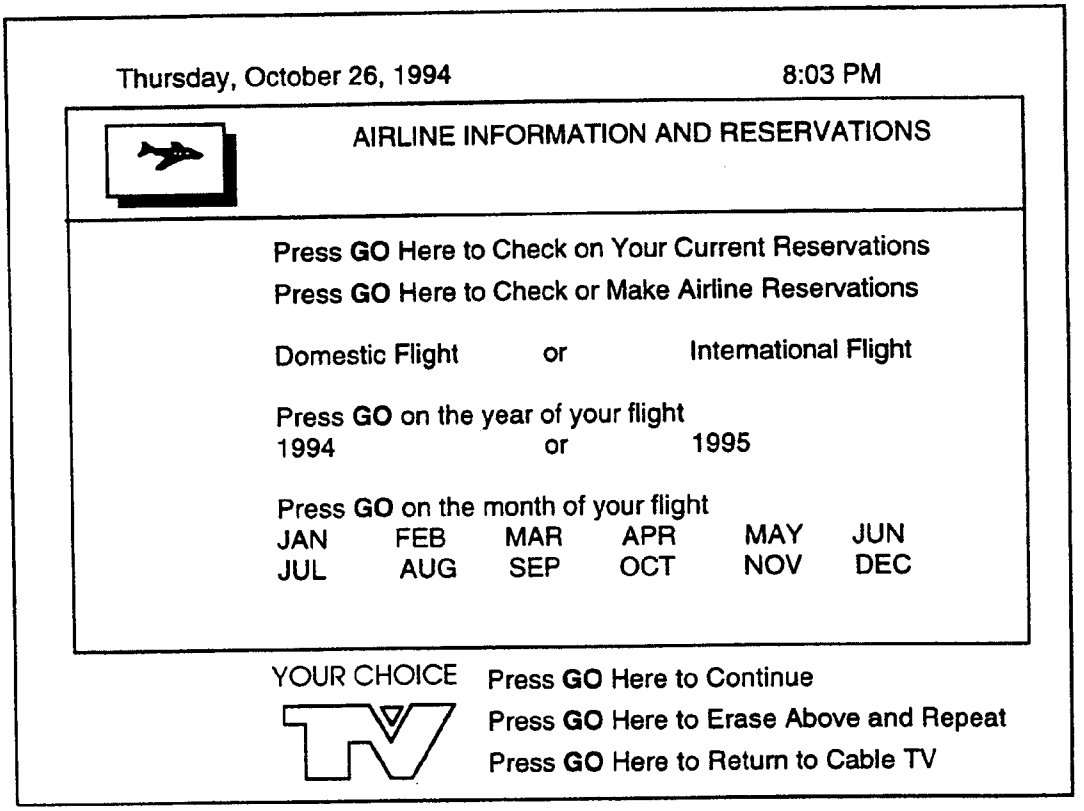
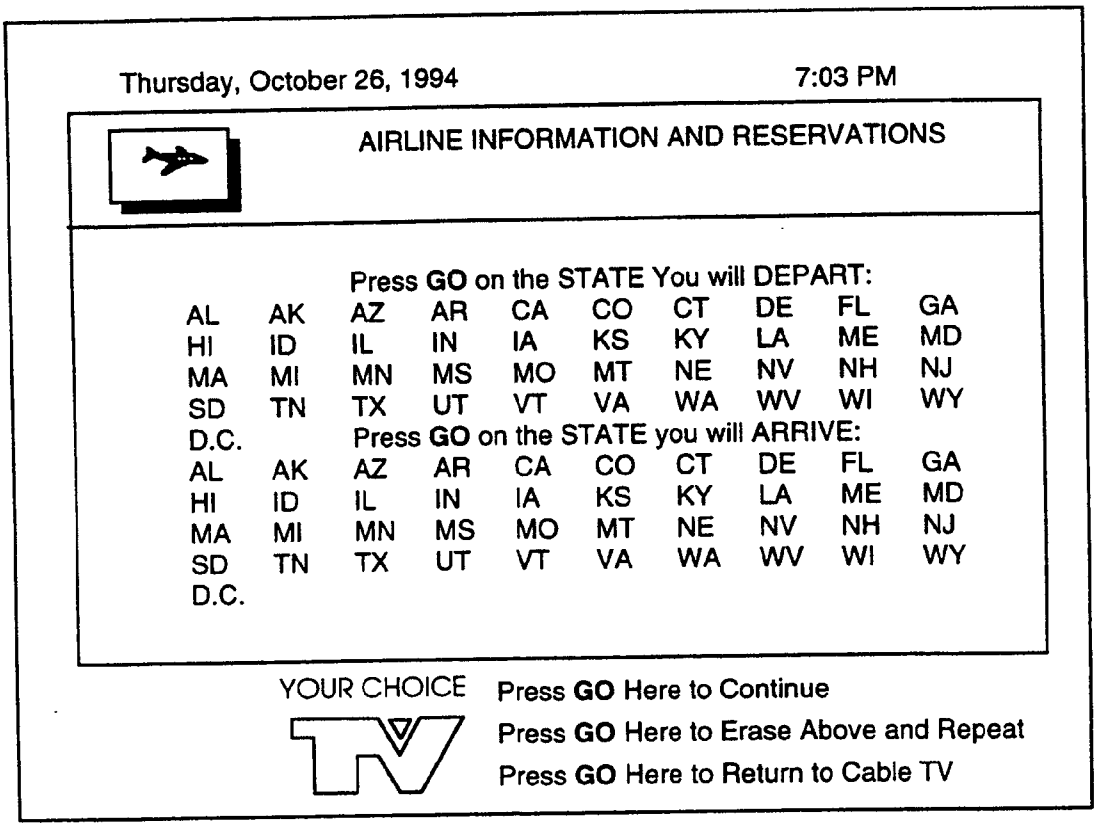

Thursday, October 26, 1994
8:03 PM
AIRLINE INFORMATION AND RESERVATIONS
Press GO Here to Check on Your Current Reservations
Press GO Here to Check or Make Airline Reservations
YOUR CHOICE
Press GO Here to Continue
Press GO Here to Erase Above and Repeat
Press GO Here to Return to Cable TV
1332

Fig. 53c


Thursday, October 26, 1994
8:03 PM
AIRLINE INFORMATION AND RESERVATIONS
Press GO Here to Check on Your Current Reservations
Press GO Here to Check or Make Airline Reservations
Domestic Flight
or
International Flight
Press GO on the year of your flight
1994
or
1995
Press GO on the month of your flight
JAN FEB MAR APR MAY JUN
JUL AUG SEP OCT NOV DEC
YOUR CHOICE
Press GO Here to Continue
Press GO Here to Erase Above and Repeat
Press GO Here to Return to Cable TV

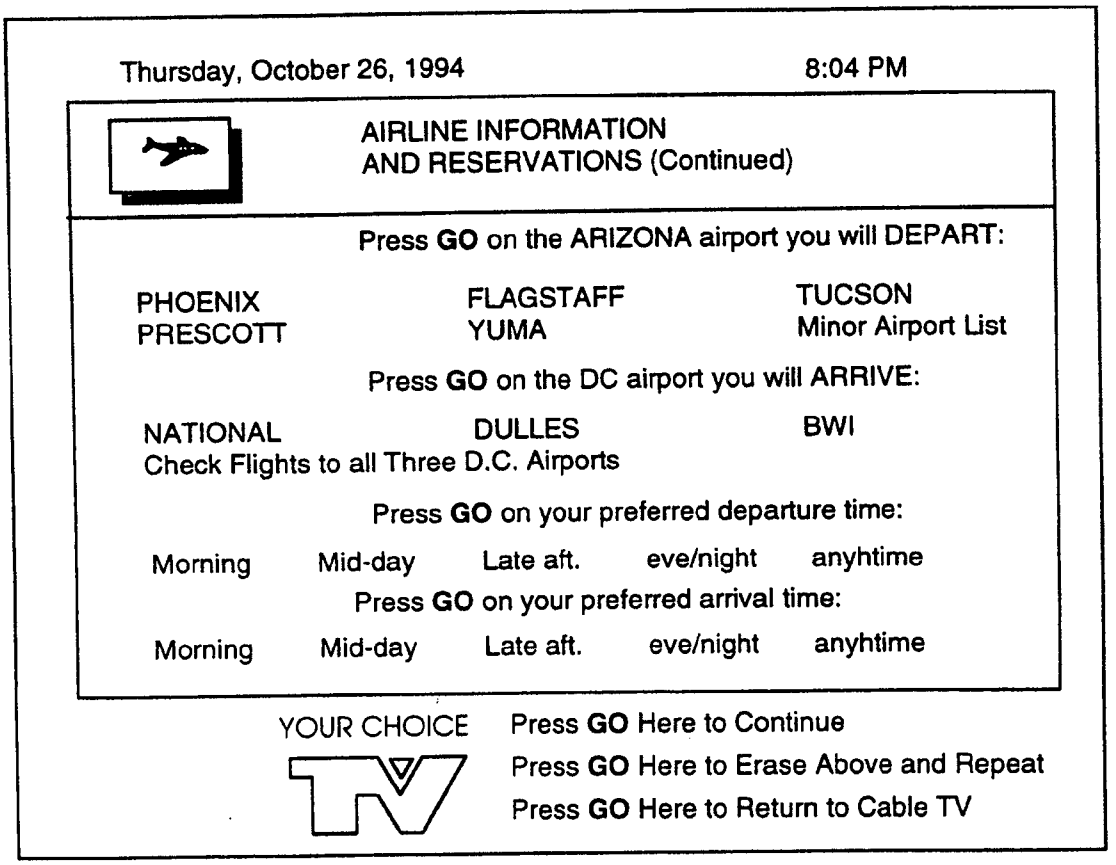
1334

Fig. 53d


Thursday, October 26, 1994
7:03 PM
AIRLINE INFORMATION AND RESERVATIONS
Press GO on the STATE You will DEPART:
AL AK AZ AR CA CO CT DE FL GA
HI ID IL IN IA KS KY LA ME MD
MA MI MN MS MO MT NE NV NH NJ
SD TN TX UT VT VA WA WV WI WY
D.C.
Press GO on the STATE you will ARRIVE:
AL AK AZ AR CA CO CT DE FL GA
HI ID IL IN IA KS KY LA ME MD
MA MI MN MS MO MT NE NV NH NJ
SD TN TX UT VT VA WA WV WI WY
D.C.
YOUR CHOICE
Press GO Here to Continue
Press GO Here to Erase Above and Repeat
Press GO Here to Return to Cable TV

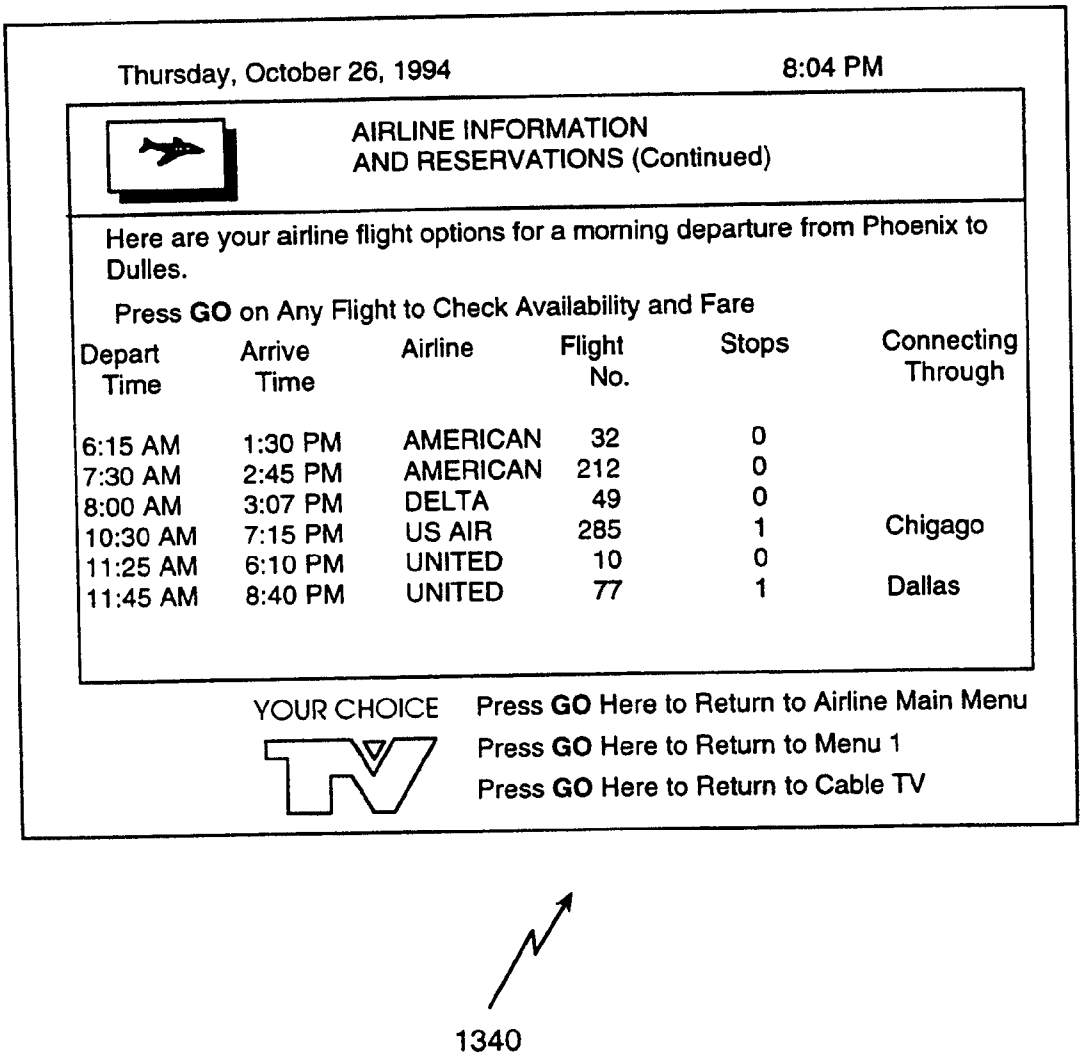
1336

Fig. 53e


Thursday, October 26, 1994
8:04 PM
AIRLINE INFORMATION
AND RESERVATIONS (Continued)
Press GO on the ARIZONA airport you will DEPART:
PHOENIX
PRESCOTT
FLAGSTAFF
YUMA
TUCSON
Minor Airport List
Press GO on the DC airport you will ARRIVE:
NATIONAL
DULLES
BWI
Check Flights to all Three D.C. Airports
Press GO on your preferred departure time:
Morning
Mid-day
Late aft.
eve/night
anyhtime
Press GO on your preferred arrival time:
Morning
Mid-day
Late aft.
eve/night
anyhtime
YOUR CHOICE
Press GO Here to Continue
Press GO Here to Erase Above and Repeat
Press GO Here to Return to Cable TV

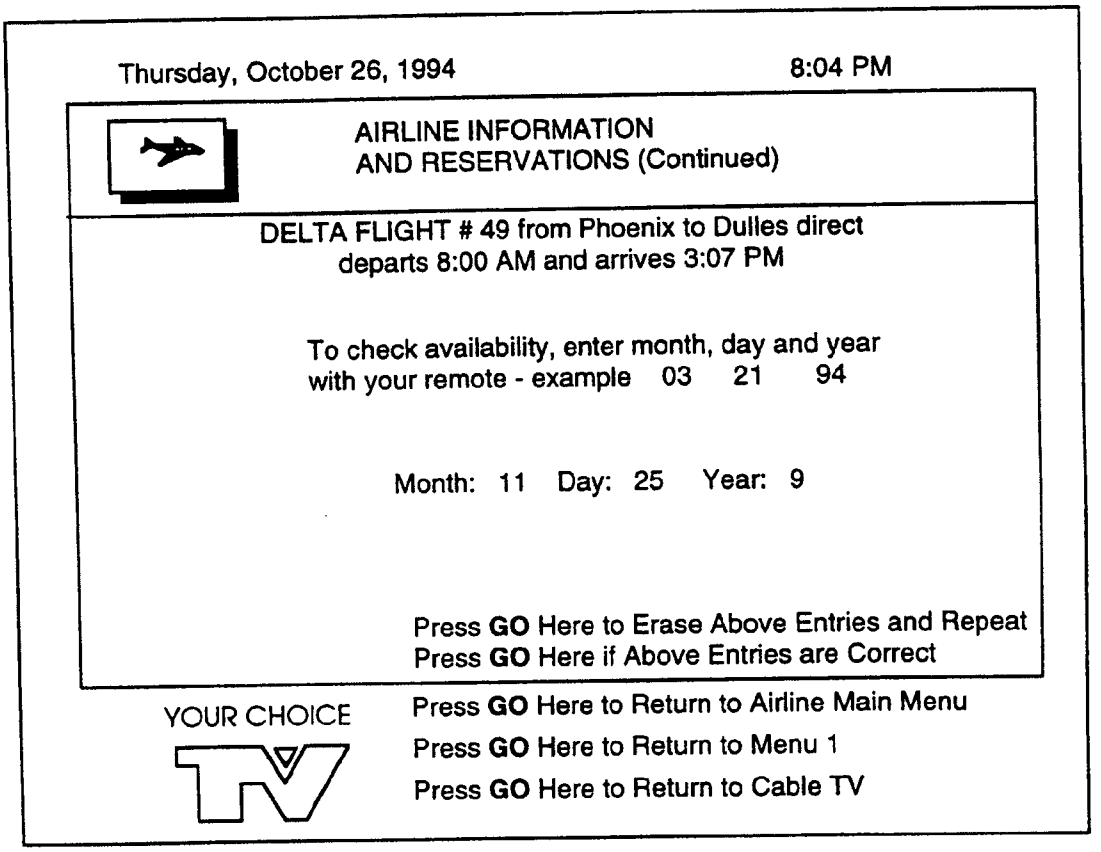
1338

Fig. 53f


Thursday, October 26, 1994
8:04 PM
AIRLINE INFORMATION
AND RESERVATIONS (Continued)
Here are your airline flight options for a morning departure from Phoenix to Dulles.
Press GO on Any Flight to Check Availability and Fare
Depart Time
Arrive Time
Airline
Flight No.
Stops
Connecting Through
6:15 AM 1:30 PM AMERICAN 32 0
7:30 AM 2:45 PM AMERICAN 212 0
8:00 AM 3:07 PM DELTA 49 0
10:30 AM 7:15 PM US AIR 285 1 Chigago
11:25 AM 6:10 PM UNITED 10 0
11:45 AM 8:40 PM UNITED 77 1 Dallas
YOUR CHOICE
TV
Press GO Here to Return to Airline Main Menu
Press GO Here to Return to Menu 1
Press GO Here to Return to Cable TV

1340

Fig. 53g


Thursday, October 26, 1994
8:04 PM
AIRLINE INFORMATION
AND RESERVATIONS (Continued)
DELTA FLIGHT # 49 from Phoenix to Dulles direct
departs 8:00 AM and arrives 3:07 PM
To check availability, enter month, day and year
with your remote - example 03 21 94
Month: 11 Day: 25 Year: 9
Press GO Here to Erase Above Entries and Repeat
Press GO Here if Above Entries are Correct
YOUR CHOICE
Press GO Here to Return to Airline Main Menu
Press GO Here to Return to Menu 1
Press GO Here to Return to Cable TV

1342

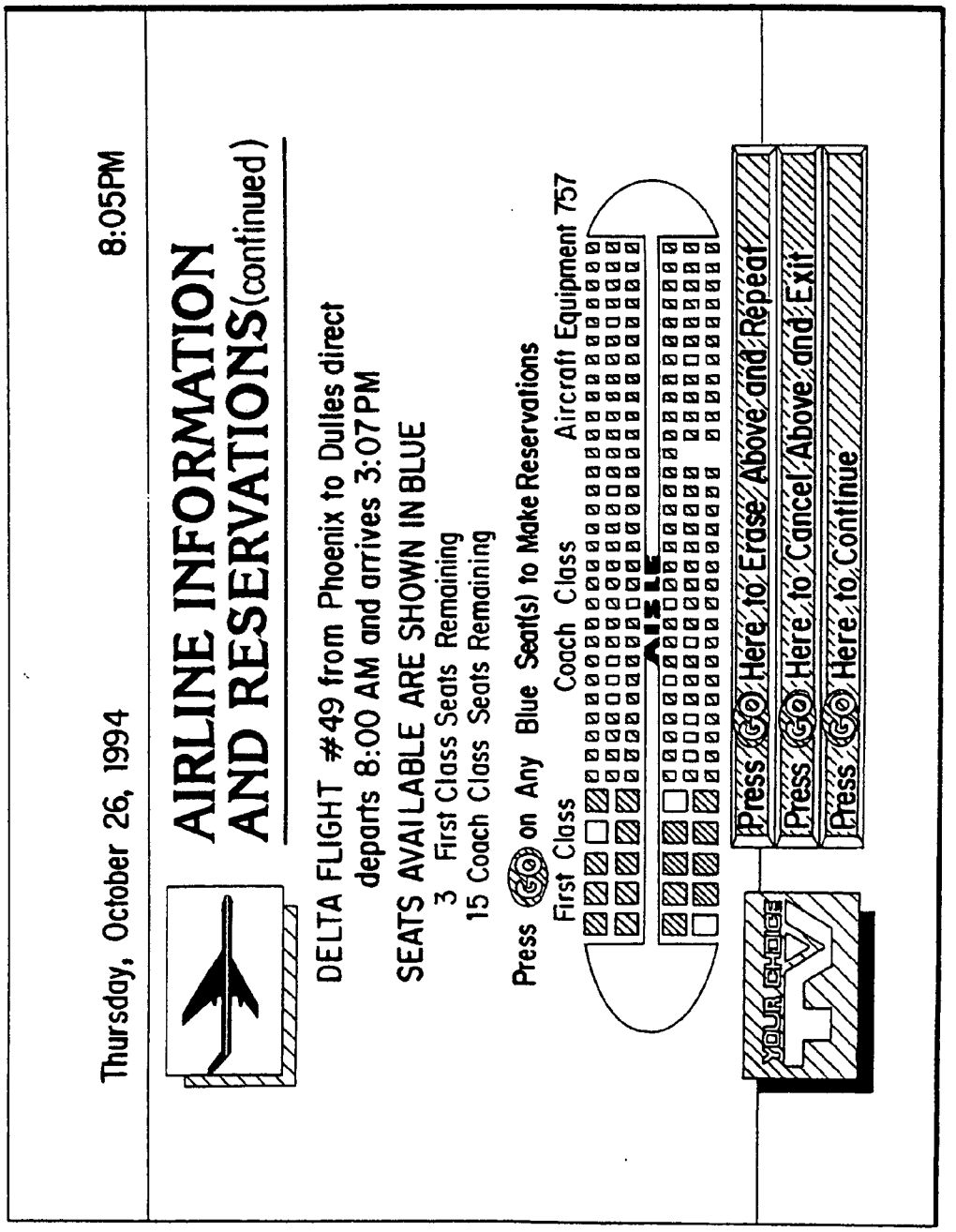
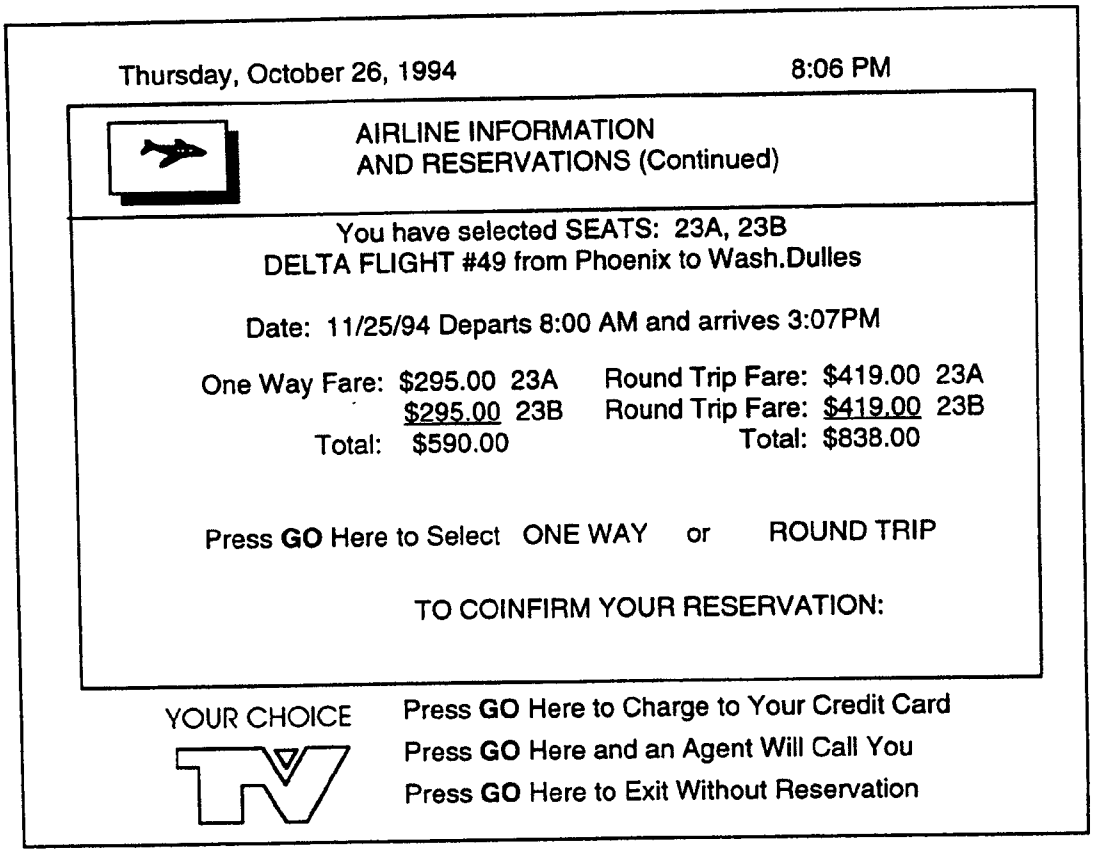

1344
Thursday, October 26, 1994
8:05PM
AIRLINE INFORMATION
AND RESERVATIONS(continued)
DELTA FLIGHT #49 from Phoenix to Dulles direct
departs 8:00 AM and arrives 3:07 PM
SEATS AVAILABLE ARE SHOWN IN BLUE
3 First Class Seats Remaining
15 Coach Class Seats Remaining
Press (GO) on Any Blue Seat(s) to Make Reservations
First Class
Coach Class
Aircraft Equipment 757
AISLE
YOUR CHOICE
Press (GO) Here to Erase Above and Repeat
Press (GO) Here to Cancel Above and Exit
Press (GO) Here to Continue

Fig. 53h

Fig. 53i


Thursday, October 26, 1994
8:06 PM
AIRLINE INFORMATION
AND RESERVATIONS (Continued)
You have selected SEATS: 23A, 23B
DELTA FLIGHT #49 from Phoenix to Wash.Dulles
Date: 11/25/94 Departs 8:00 AM and arrives 3:07PM
One Way Fare: $295.00 23A
$295.00 23B
Total: $590.00
Round Trip Fare: $419.00 23A
Round Trip Fare: $419.00 23B
Total: $838.00
Press GO Here to Select ONE WAY or ROUND TRIP
TO COINFIRM YOUR RESERVATION:
YOUR CHOICE
TV
Press GO Here to Charge to Your Credit Card
Press GO Here and an Agent Will Call You
Press GO Here to Exit Without Reservation

1346

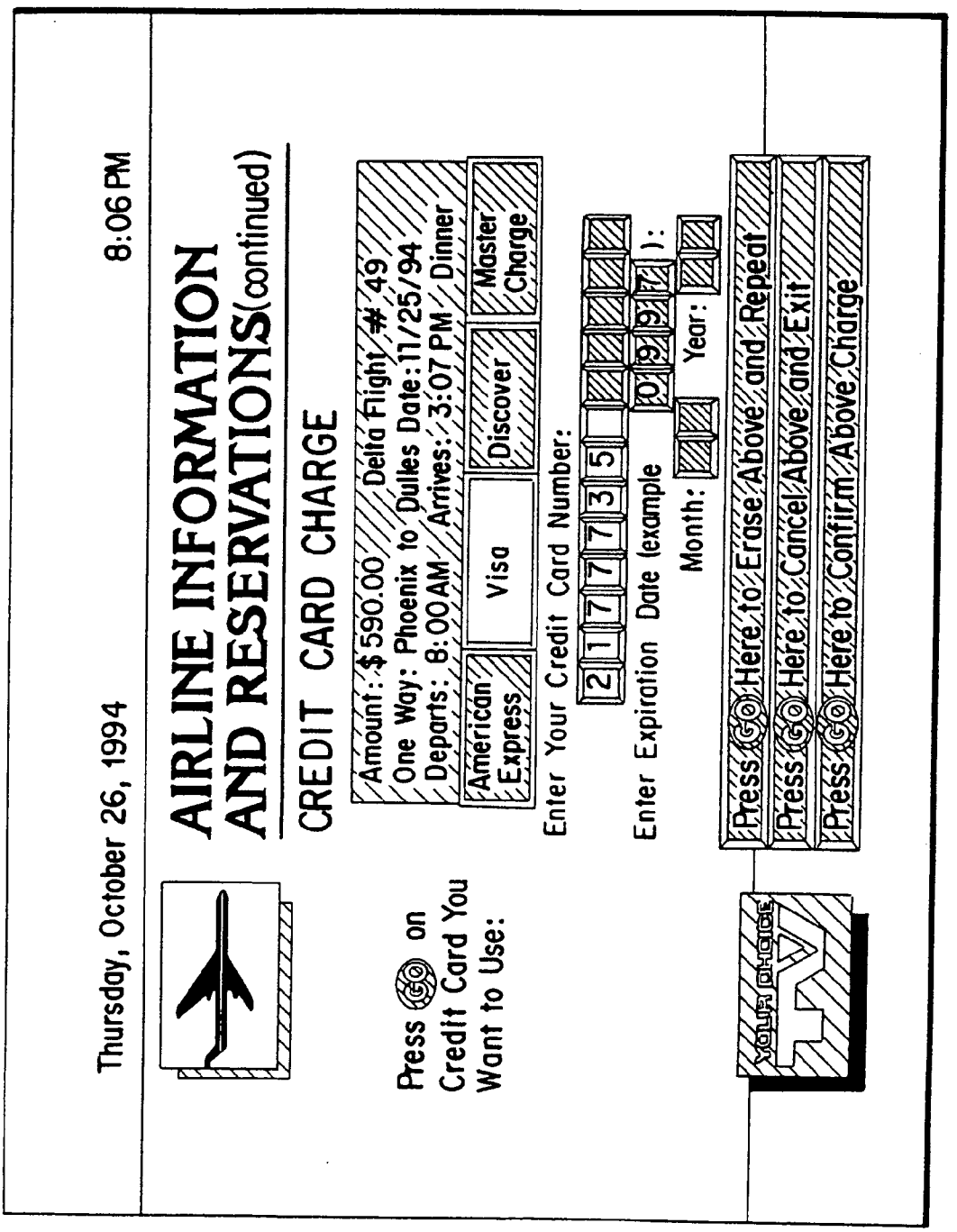
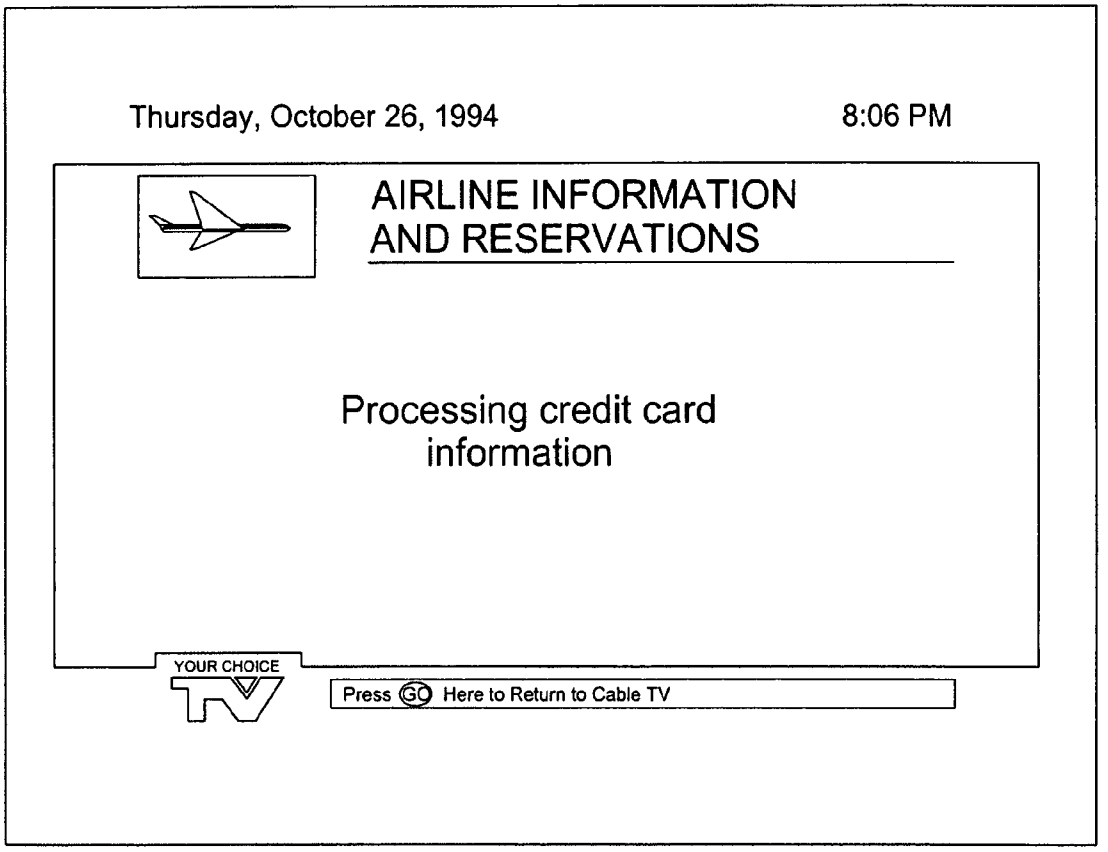

1348
Thursday, October 26, 1994
8:06 PM
AIRLINE INFORMATION AND RESERVATIONS(continued)
CREDIT CARD CHARGE
Amount: $590.00 Delta Flight # 49
One Way: Phoenix to Dulles Date: 11/25/94
Departs: 8:00 AM Arrives: 3:07 PM Dinner
Press GO on Credit Card You Want to Use:
American Express
Visa
Discover
Master Charge
Enter Your Credit Card Number:
2 1 7 7 7 3 5
Enter Expiration Date (example 09 97):
Month:
Year:
Press GO Here to Erase Above and Repeat
Press GO Here to Cancel Above and Exit
Press GO Here to Confirm Above Charge
YOUR CHOICE

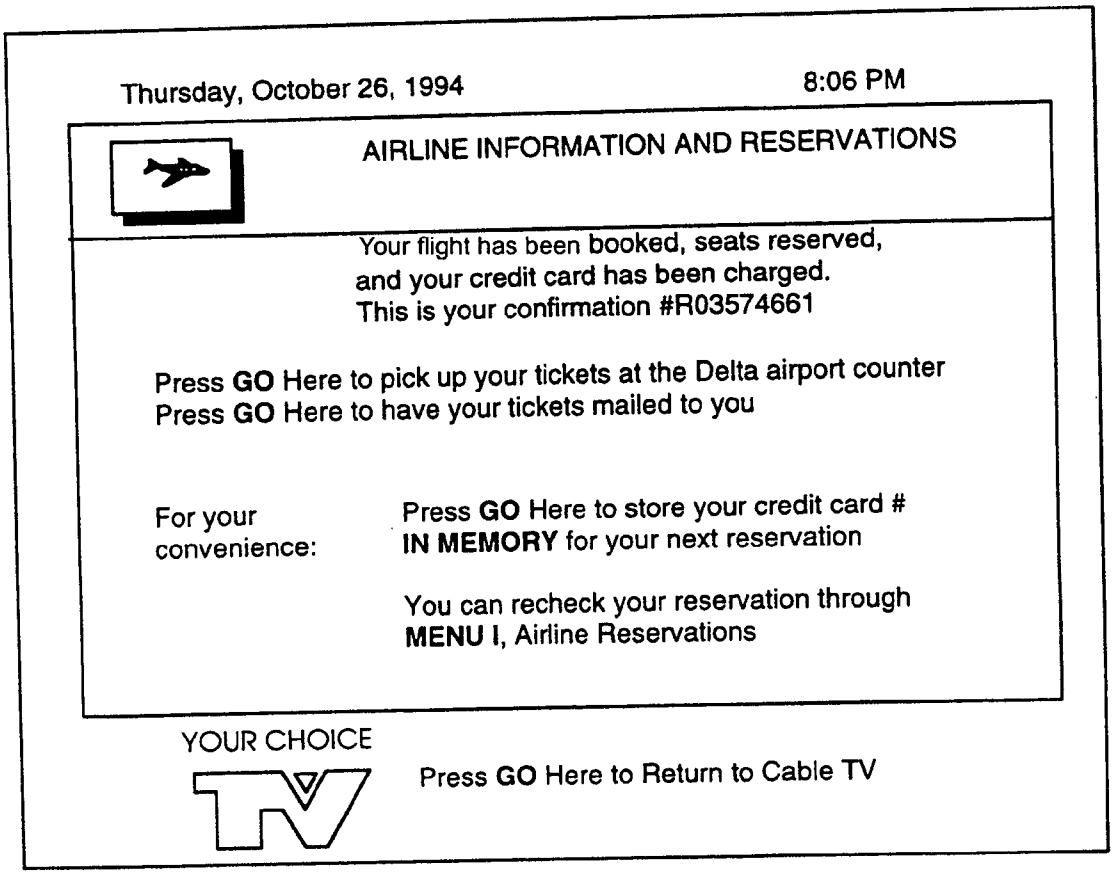
Fig. 53j


Thursday, October 26, 1994
8:06 PM
AIRLINE INFORMATION
AND RESERVATIONS
Processing credit card
information
YOUR CHOICE
TV
Press GO Here to Return to Cable TV

1350

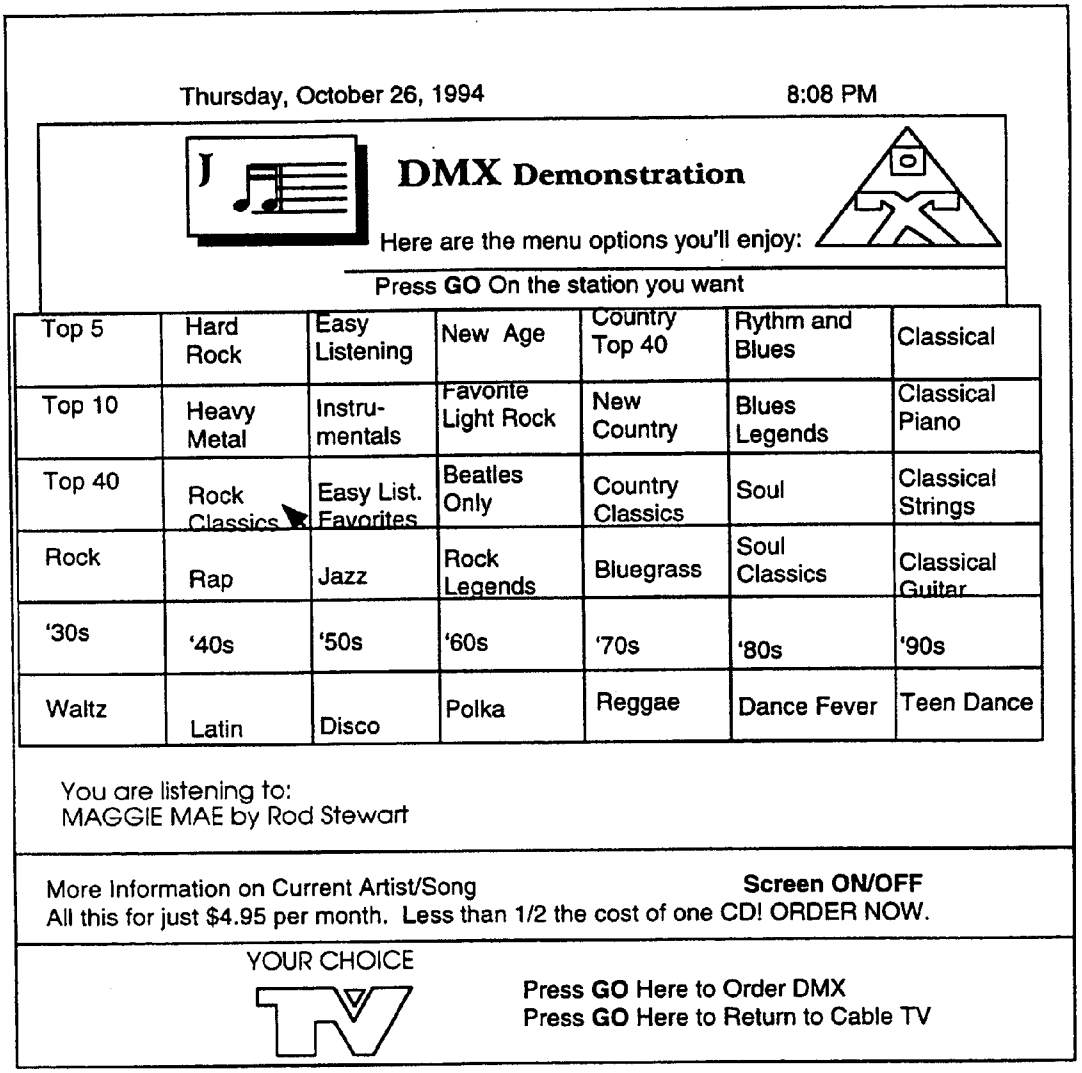
FIG. 53k

Fig. 53l


Thursday, October 26, 1994
8:06 PM
AIRLINE INFORMATION AND RESERVATIONS
Your flight has been booked, seats reserved,
and your credit card has been charged.
This is your confirmation #R03574661
Press GO Here to pick up your tickets at the Delta airport counter
Press GO Here to have your tickets mailed to you
For your convenience:
Press GO Here to store your credit card # IN MEMORY for your next reservation
You can recheck your reservation through MENU I, Airline Reservations
YOUR CHOICE
TV
Press GO Here to Return to Cable TV

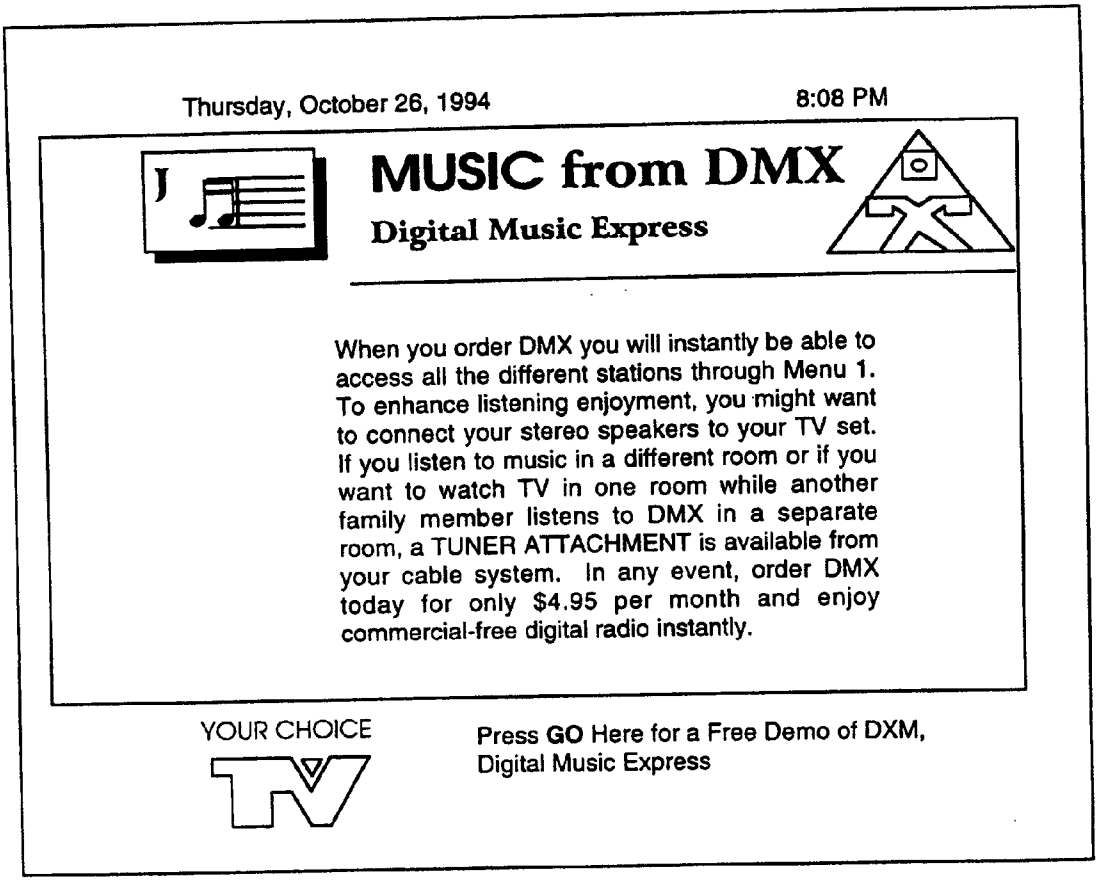
1352

Fig. 54a


Thursday, October 26, 1994
8:08 PM
DMX Demonstration
Here are the menu options you'll enjoy:
Press GO On the station you want
Top 5
Hard Rock
Easy Listening
New Age
Country Top 40
Rythm and Blues
Classical
Top 10
Heavy Metal
Instru-mentals
Favorite Light Rock
New Country
Blues Legends
Classical Piano
Top 40
Rock Classics
Easy List. Favorites
Beatles Only
Country Classics
Soul
Classical Strings
Rock
Rap
Jazz
Rock Legends
Bluegrass
Soul Classics
Classical Guitar
'30s
'40s
'50s
'60s
'70s
'80s
'90s
Waltz
Latin
Disco
Polka
Reggae
Dance Fever
Teen Dance
You are listening to:
MAGGIE MAE by Rod Stewart
More Information on Current Artist/Song
Screen ON/OFF
All this for just $4.95 per month. Less than 1/2 the cost of one CD! ORDER NOW.
YOUR CHOICE
Press GO Here to Order DMX
Press GO Here to Return to Cable TV

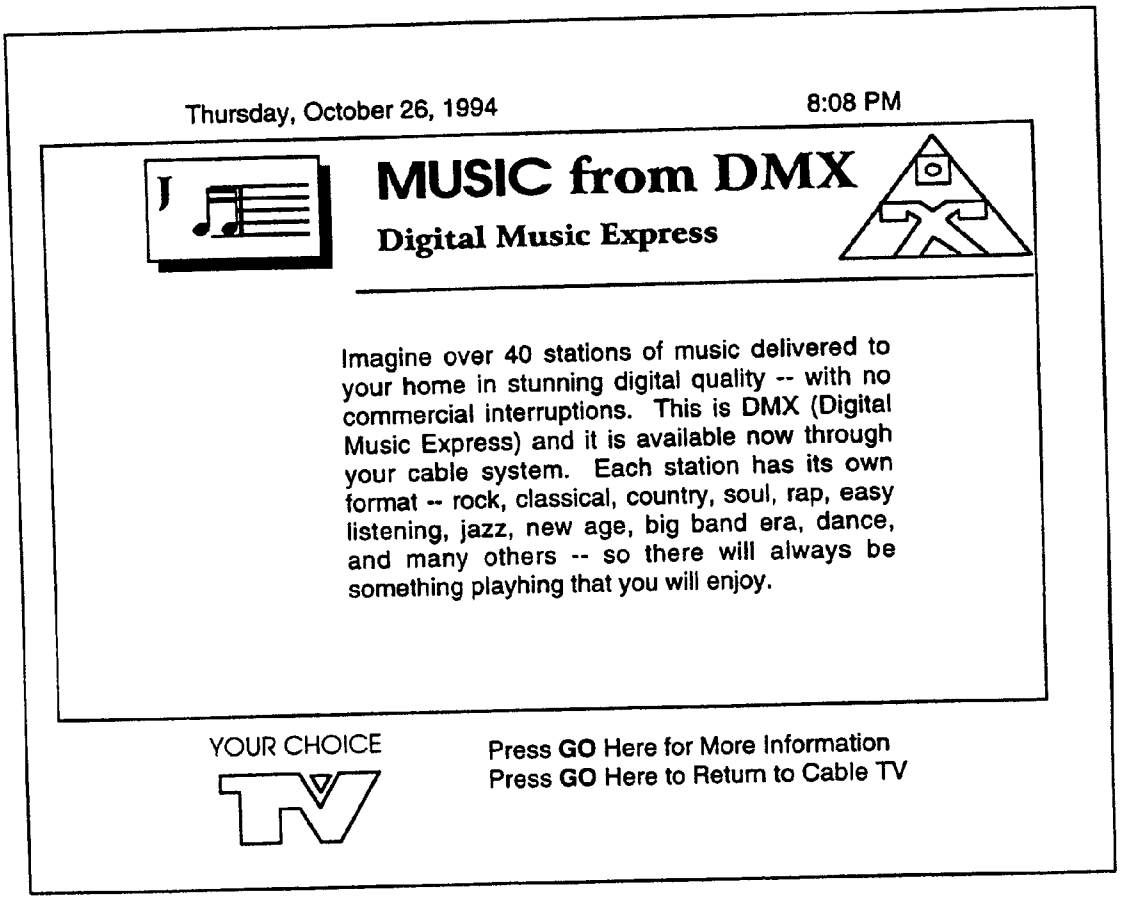
1038

Fig. 54b


Thursday, October 26, 1994
8:08 PM
MUSIC from DMX
Digital Music Express
When you order DMX you will instantly be able to access all the different stations through Menu 1. To enhance listening enjoyment, you might want to connect your stereo speakers to your TV set. If you listen to music in a different room or if you want to watch TV in one room while another family member listens to DMX in a separate room, a TUNER ATTACHMENT is available from your cable system. In any event, order DMX today for only $4.95 per month and enjoy commercial-free digital radio instantly.
YOUR CHOICE
Press GO Here for a Free Demo of DXM, Digital Music Express

1400

Fig. 54c


Thursday, October 26, 1994
8:08 PM
MUSIC from DMX
Digital Music Express
Imagine over 40 stations of music delivered to your home in stunning digital quality -- with no commercial interruptions. This is DMX (Digital Music Express) and it is available now through your cable system. Each station has its own format -- rock, classical, country, soul, rap, easy listening, jazz, new age, big band era, dance, and many others -- so there will always be something playhing that you will enjoy.
YOUR CHOICE
TV
Press GO Here for More Information
Press GO Here to Return to Cable TV

1404

Fig. 54d

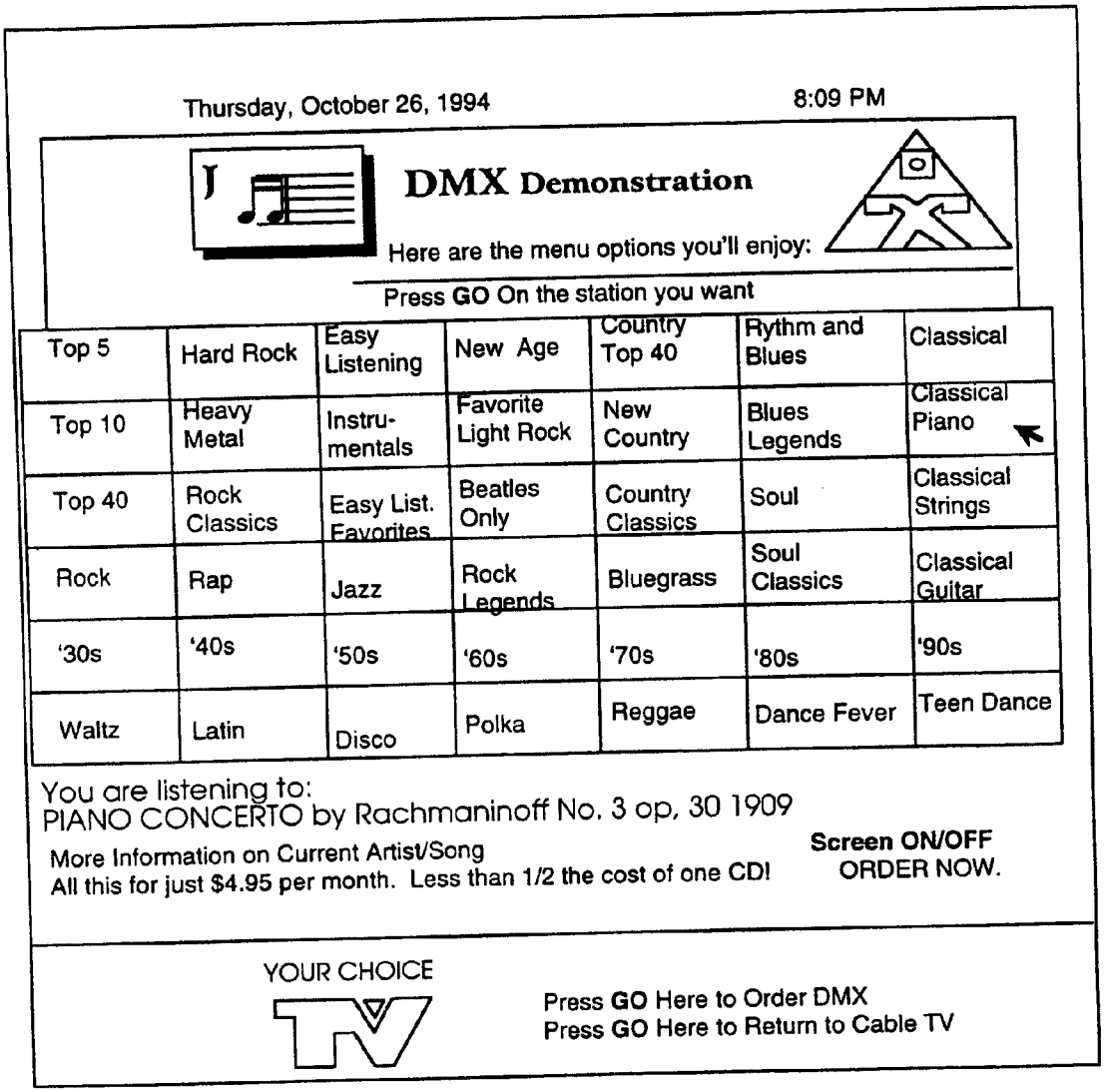

Thursday, October 26, 1994
8:09 PM
DMX Demonstration
Here are the menu options you'll enjoy:
Press GO On the station you want
Top 5
Hard Rock
Easy Listening
New Age
Country Top 40
Rythm and Blues
Classical
Top 10
Heavy Metal
Instru-mentals
Favorite Light Rock
New Country
Blues Legends
Classical Piano
Top 40
Rock Classics
Easy List. Favorites
Beatles Only
Country Classics
Soul
Classical Strings
Rock
Rap
Jazz
Rock Legends
Bluegrass
Soul Classics
Classical Guitar
'30s
'40s
'50s
'60s
'70s
'80s
'90s
Waltz
Latin
Disco
Polka
Reggae
Dance Fever
Teen Dance
You are listening to:
PIANO CONCERTO by Rachmaninoff No. 3 op, 30 1909
More Information on Current Artist/Song
All this for just $4.95 per month. Less than 1/2 the cost of one CD!
Screen ON/OFF
ORDER NOW.
YOUR CHOICE
TV
Press GO Here to Order DMX
Press GO Here to Return to Cable TV
1408

Fig. 54e

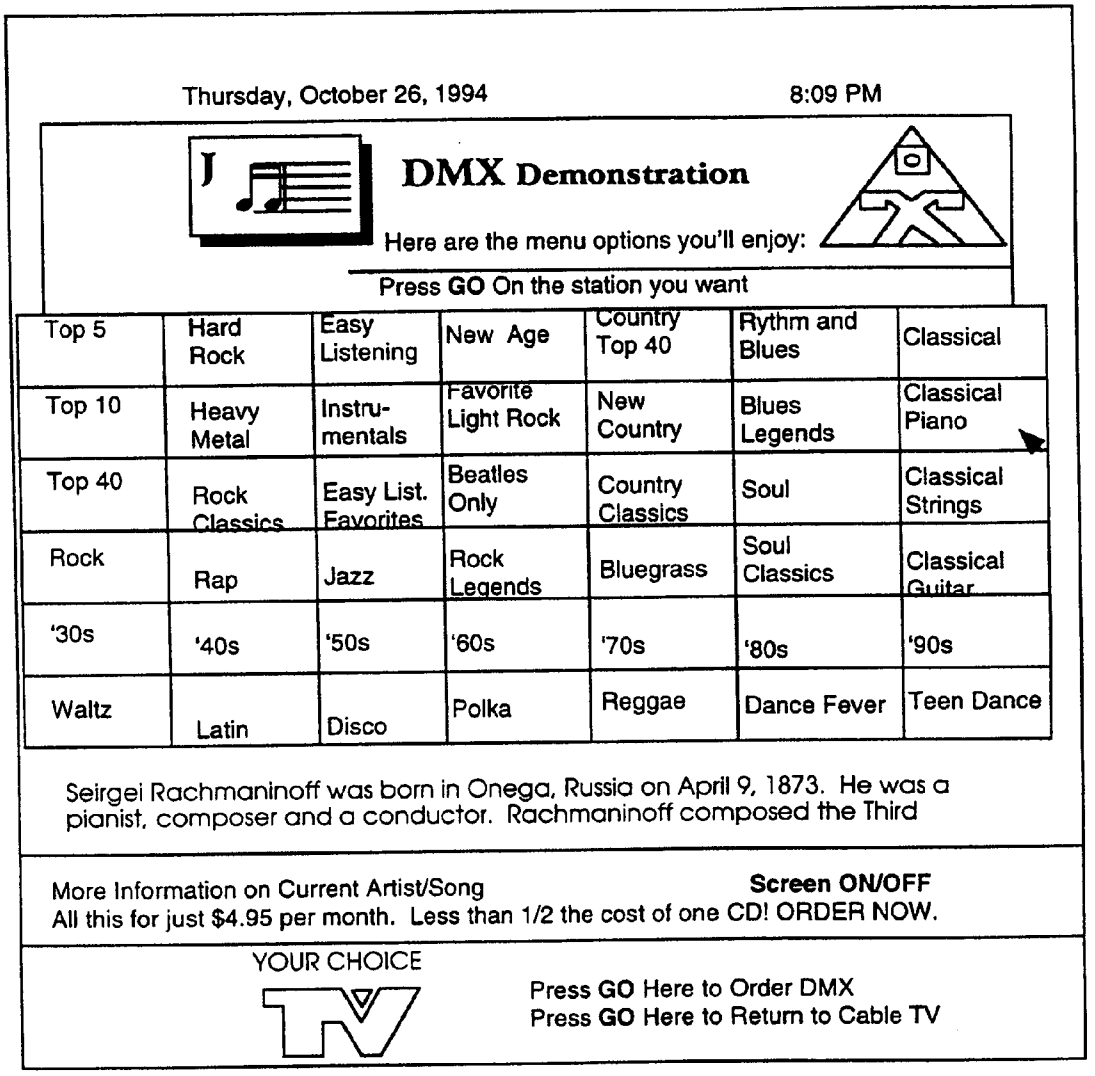

Thursday, October 26, 1994
8:09 PM
DMX Demonstration
Here are the menu options you'll enjoy:
Press GO On the station you want
Top 5
Hard Rock
Easy Listening
New Age
Country Top 40
Rythm and Blues
Classical
Top 10
Heavy Metal
Instru-mentals
Favorite Light Rock
New Country
Blues Legends
Classical Piano
Top 40
Rock Classics
Easy List. Favorites
Beatles Only
Country Classics
Soul
Classical Strings
Rock
Rap
Jazz
Rock Legends
Bluegrass
Soul Classics
Classical Guitar
'30s
'40s
'50s
'60s
'70s
'80s
'90s
Waltz
Latin
Disco
Polka
Reggae
Dance Fever
Teen Dance
Seirgei Rachmaninoff was born in Onega, Russia on April 9, 1873. He was a pianist, composer and a conductor. Rachmaninoff composed the Third
More Information on Current Artist/Song
Screen ON/OFF
All this for just $4.95 per month. Less than 1/2 the cost of one CD! ORDER NOW.
YOUR CHOICE
Press GO Here to Order DMX
Press GO Here to Return to Cable TV
1412

Fig. 55a

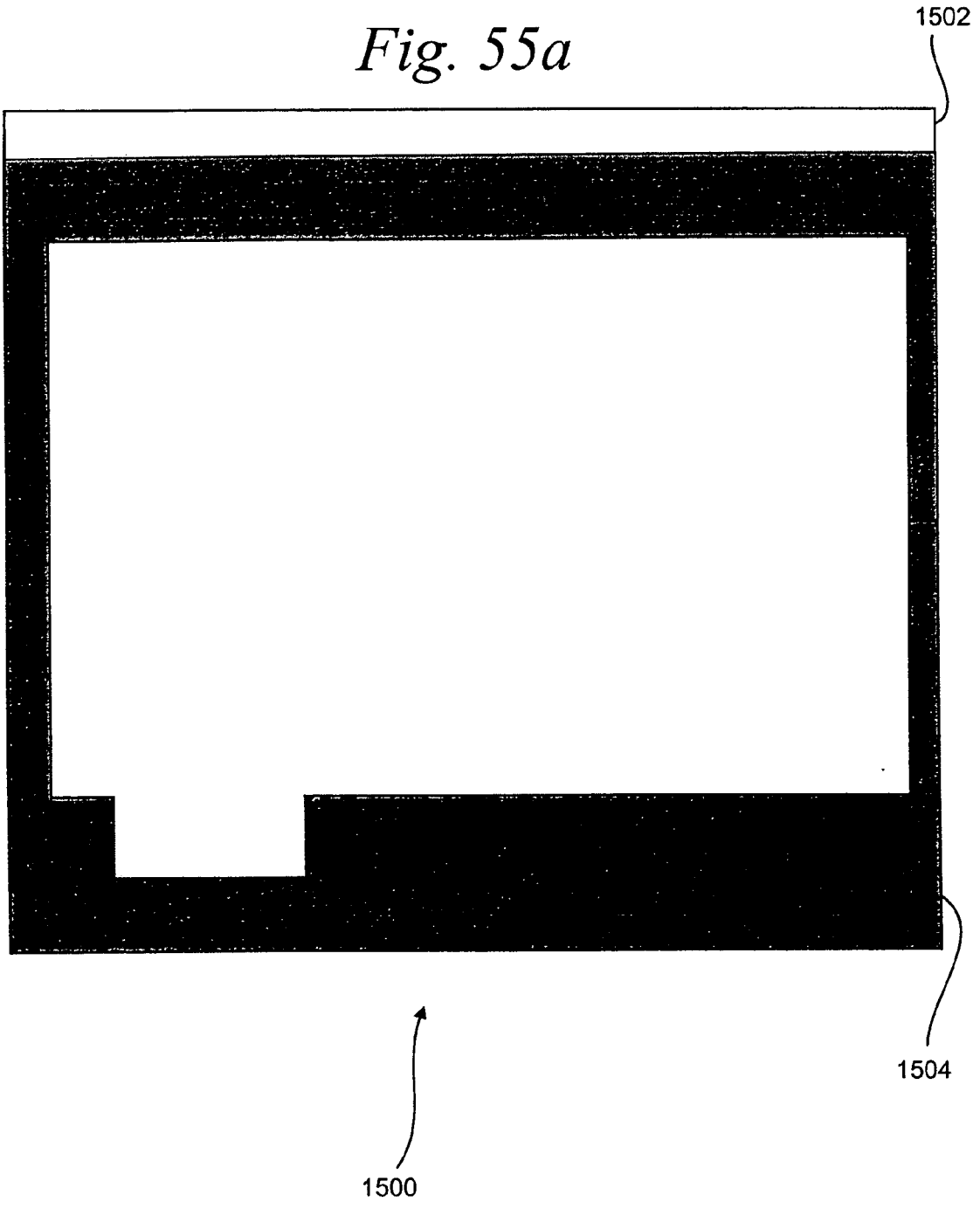


Fig. 55b

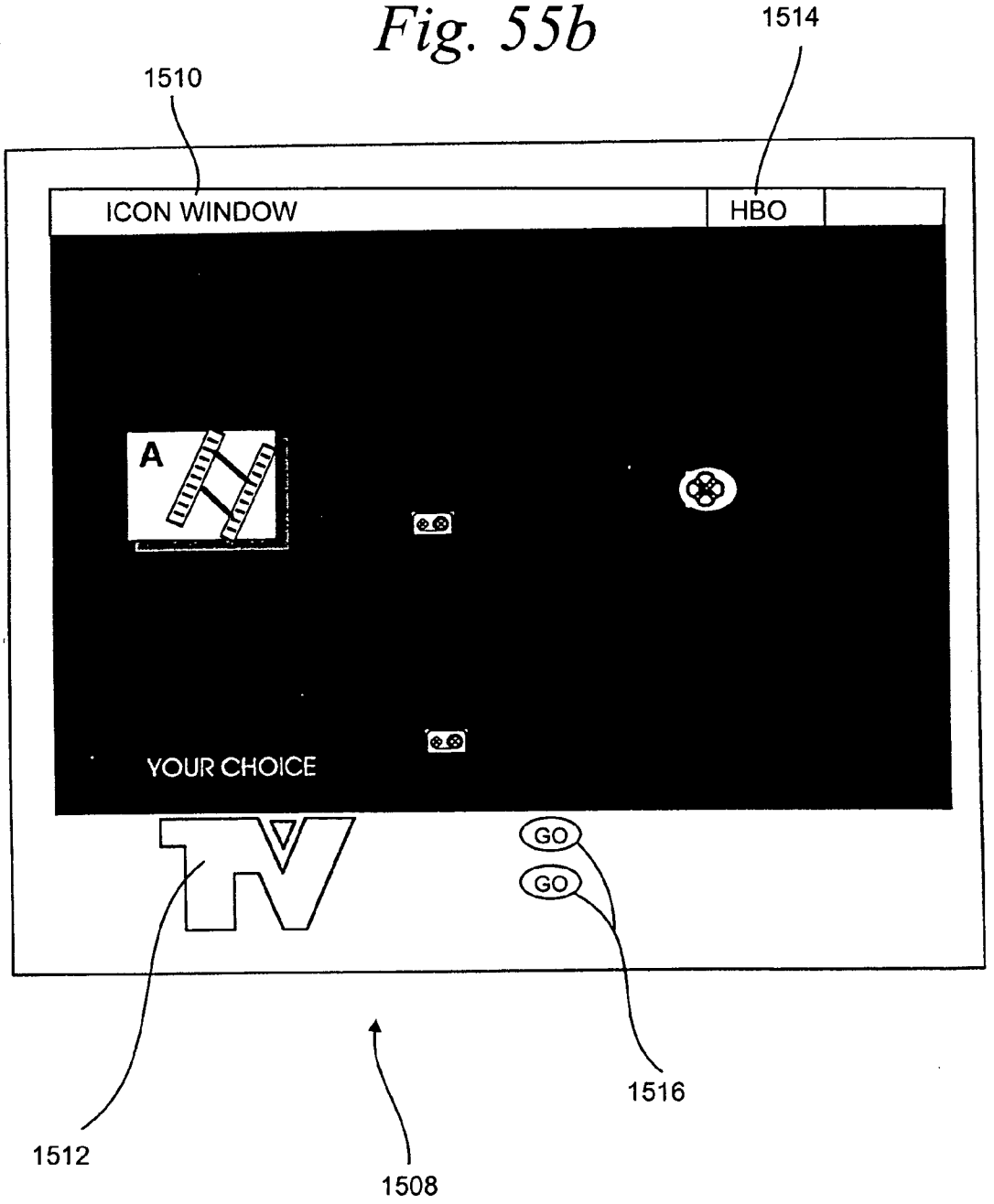


Fig. 55c

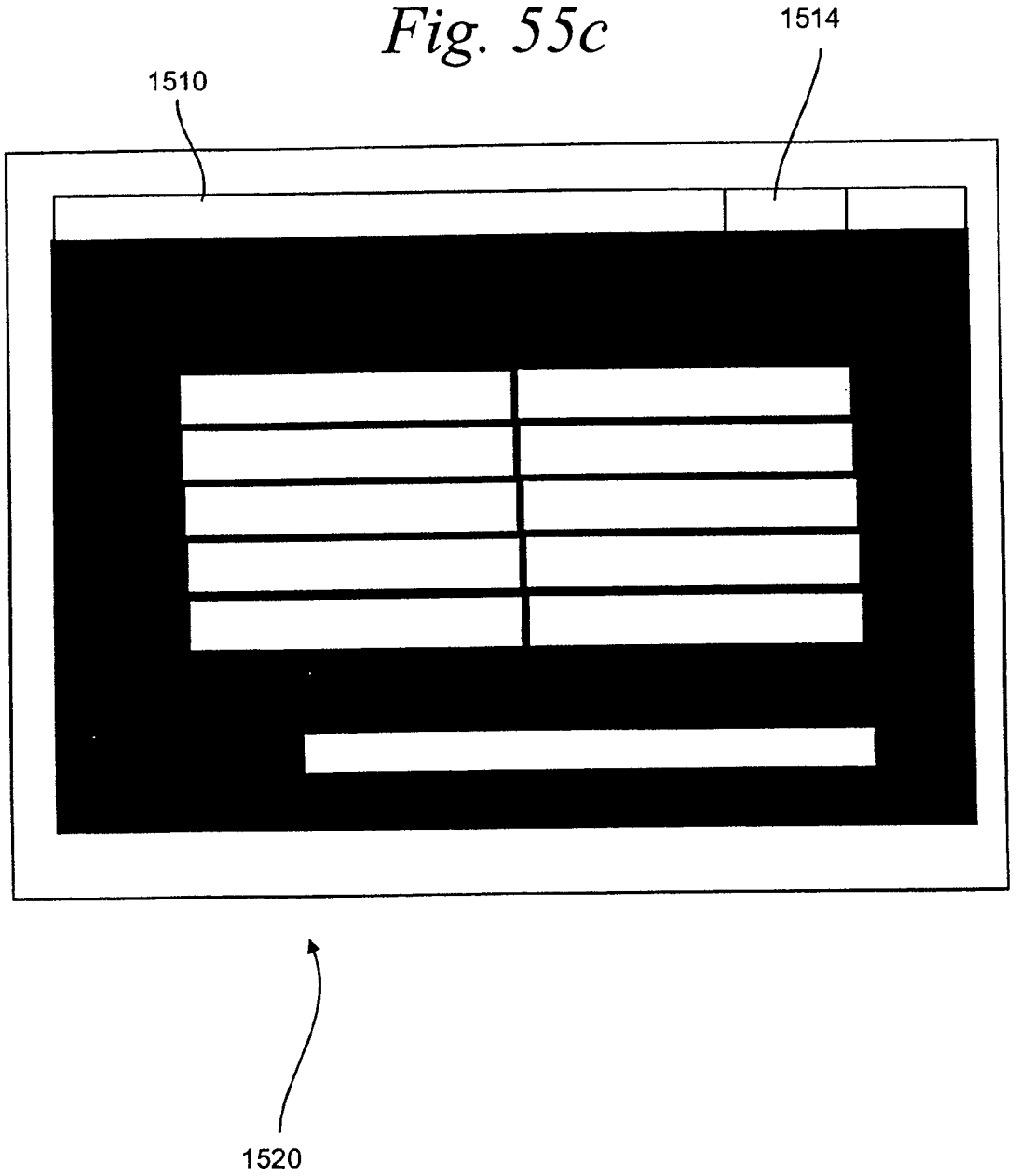


Fig. 55d

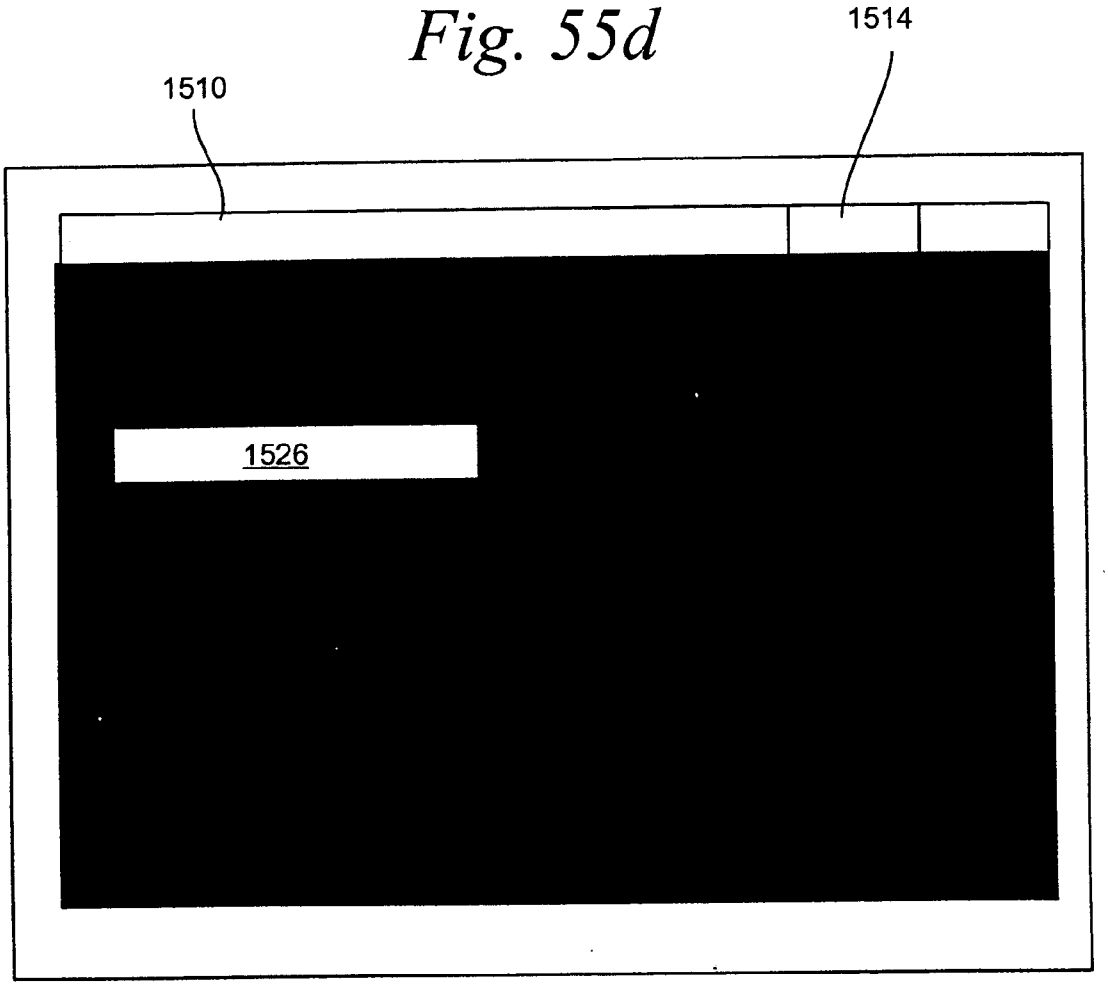


Fig. 55e

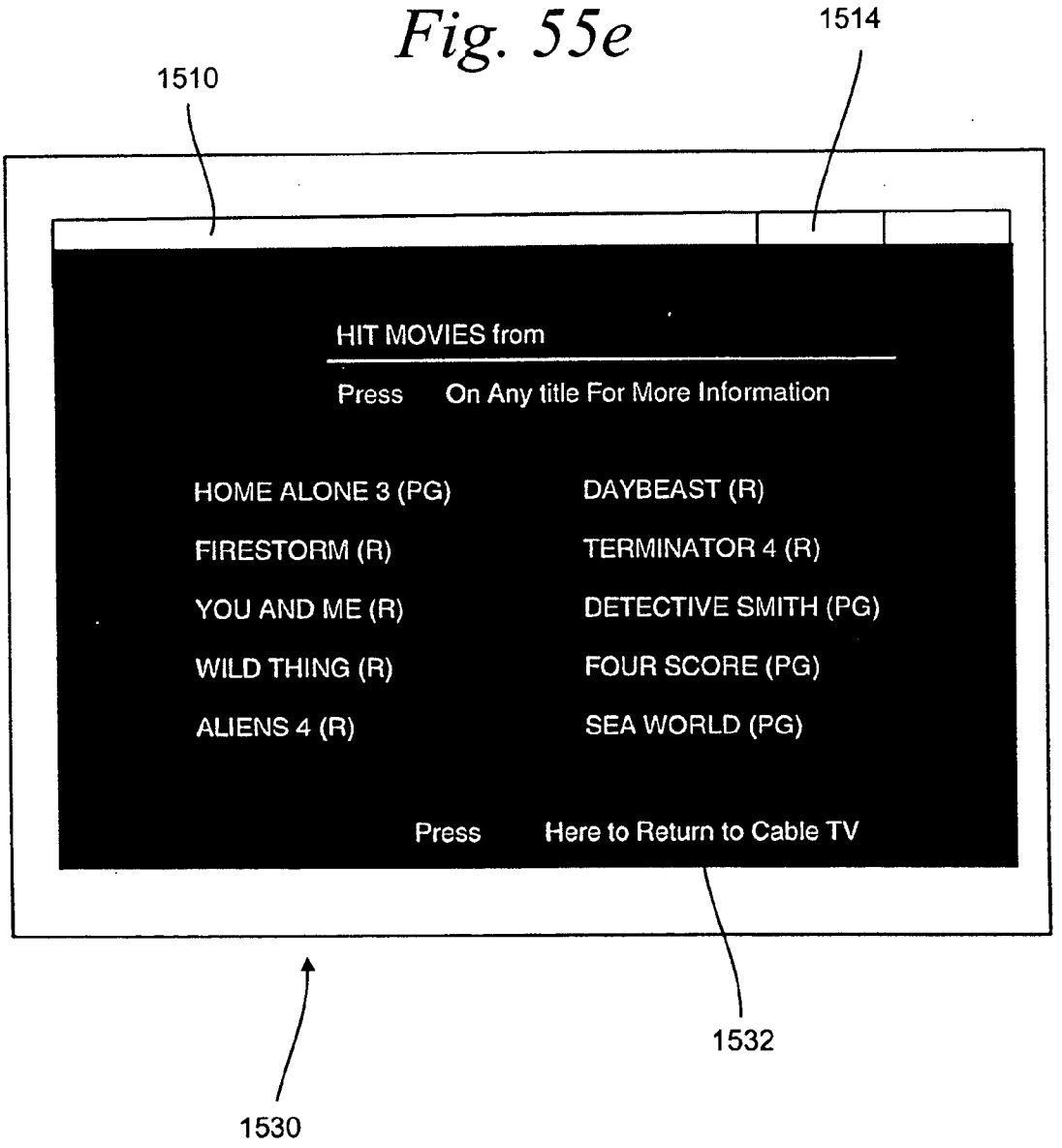
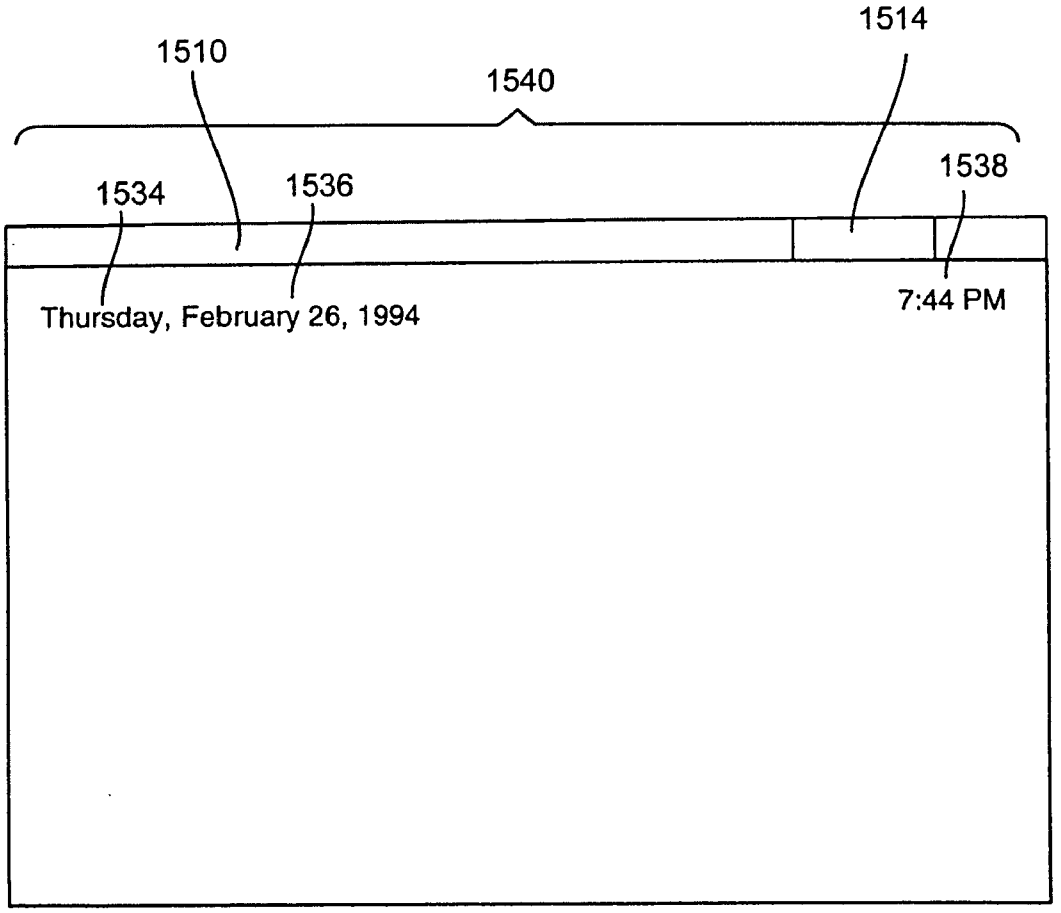

1510
1514
HIT MOVIES from
Press On Any title For More Information
HOME ALONE 3 (PG)
DAYBEAST (R)
FIRESTORM (R)
TERMINATOR 4 (R)
YOU AND ME (R)
DETECTIVE SMITH (PG)
WILD THING (R)
FOUR SCORE (PG)
ALIENS 4 (R)
SEA WORLD (PG)
Press Here to Return to Cable TV
1532
1530

Fig. 55f


1514
1510
1540
1538
1534
1536
Thursday, February 26, 1994
7:44 PM

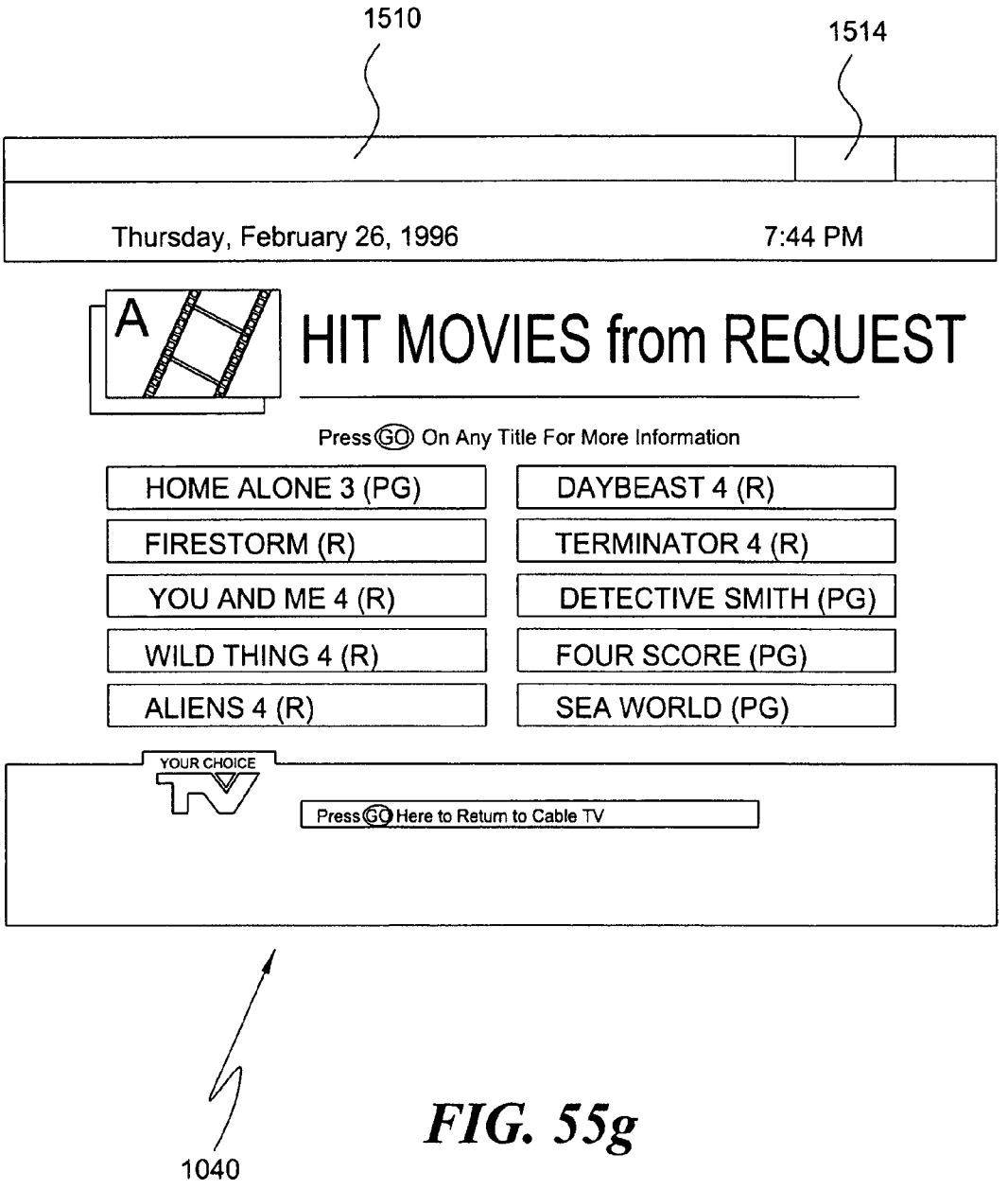

1510
1514
Thursday, February 26, 1996
7:44 PM
A
HIT MOVIES from REQUEST
Press GO On Any Title For More Information
HOME ALONE 3 (PG)
DAYBEAST 4 (R)
FIRESTORM (R)
TERMINATOR 4 (R)
YOU AND ME 4 (R)
DETECTIVE SMITH (PG)
WILD THING 4 (R)
FOUR SCORE (PG)
ALIENS 4 (R)
SEA WORLD (PG)
YOUR CHOICE TV
Press GO Here to Return to Cable TV
1040

FIG. 55g

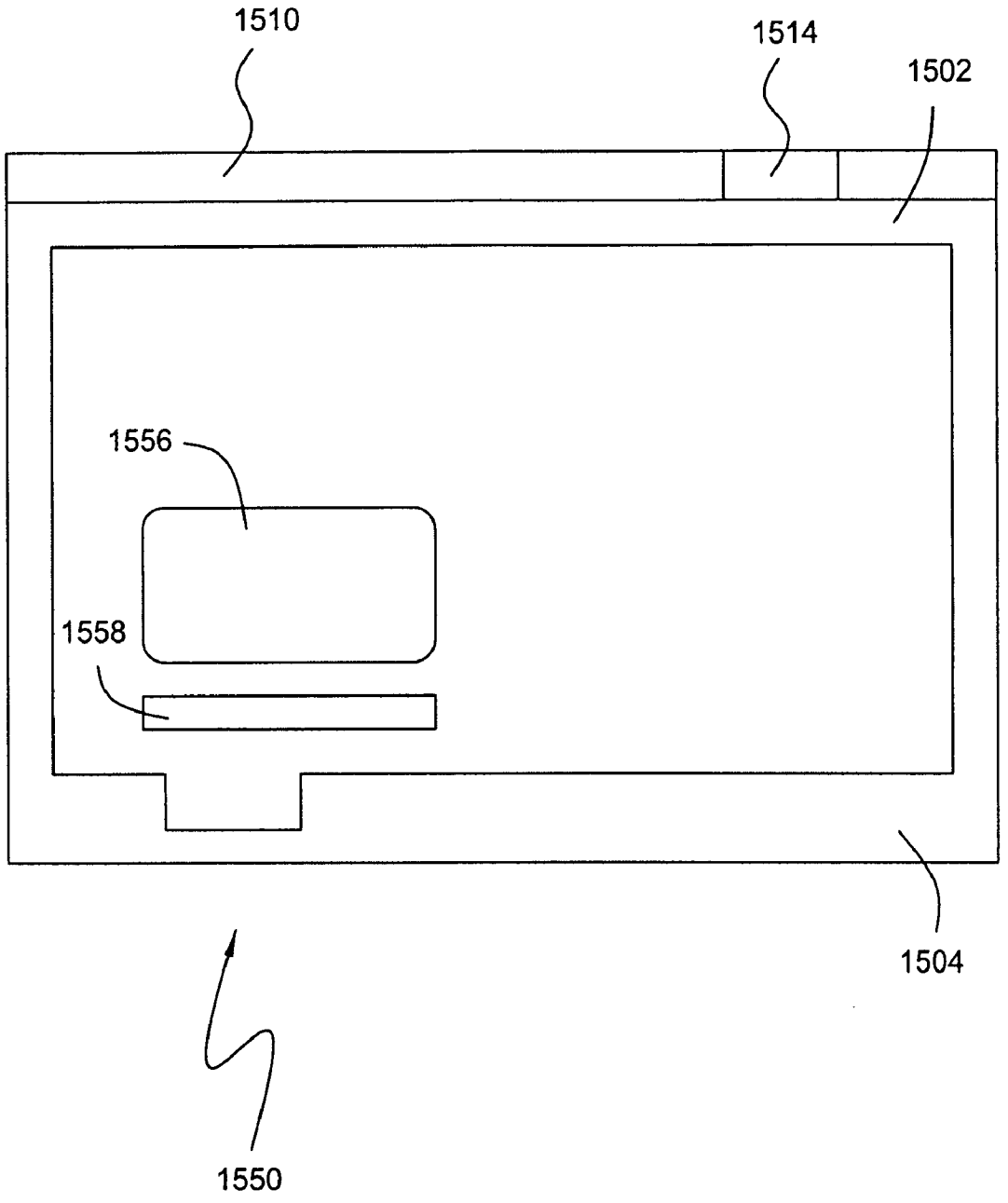


FIG. 56a

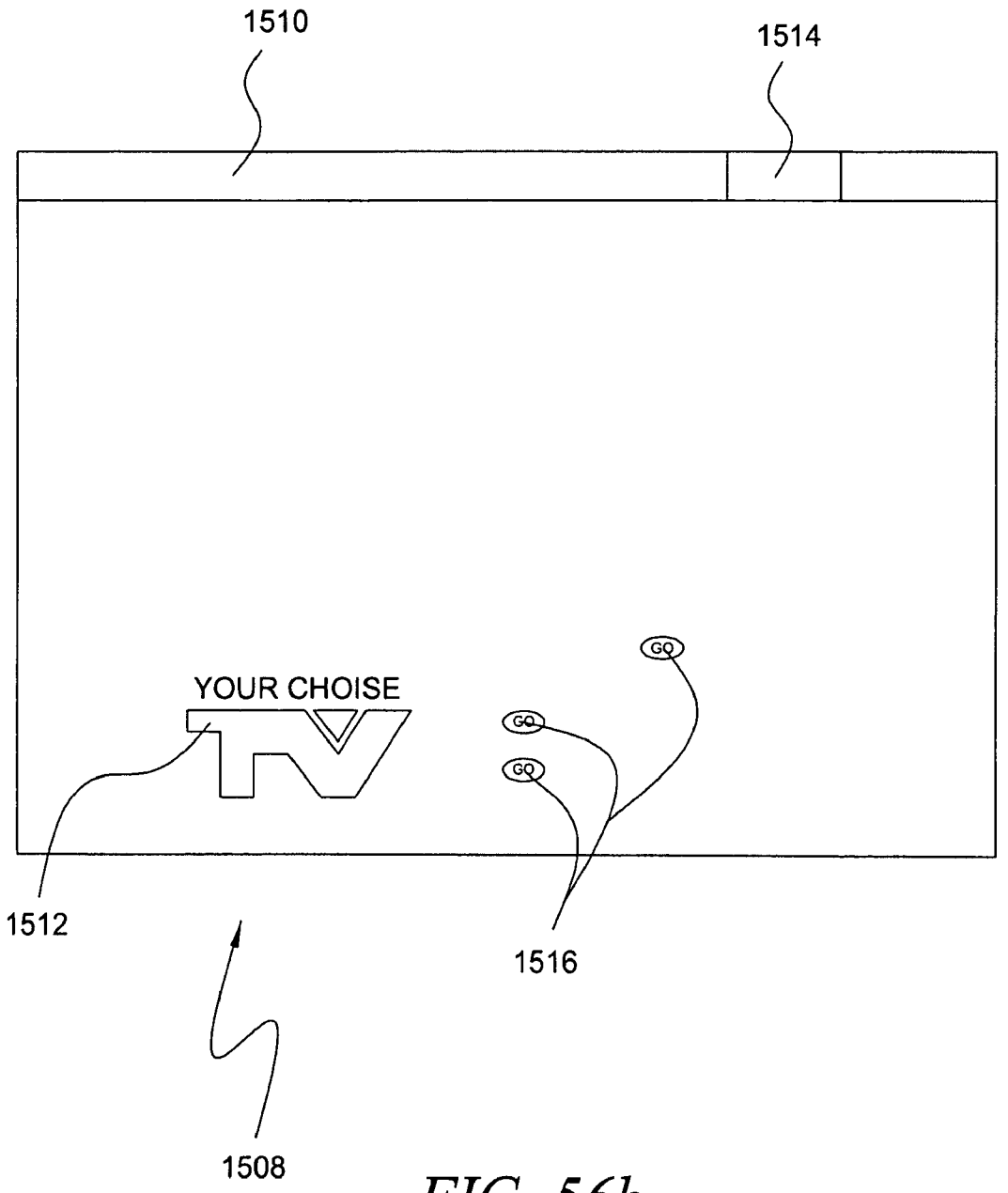


FIG. 56b

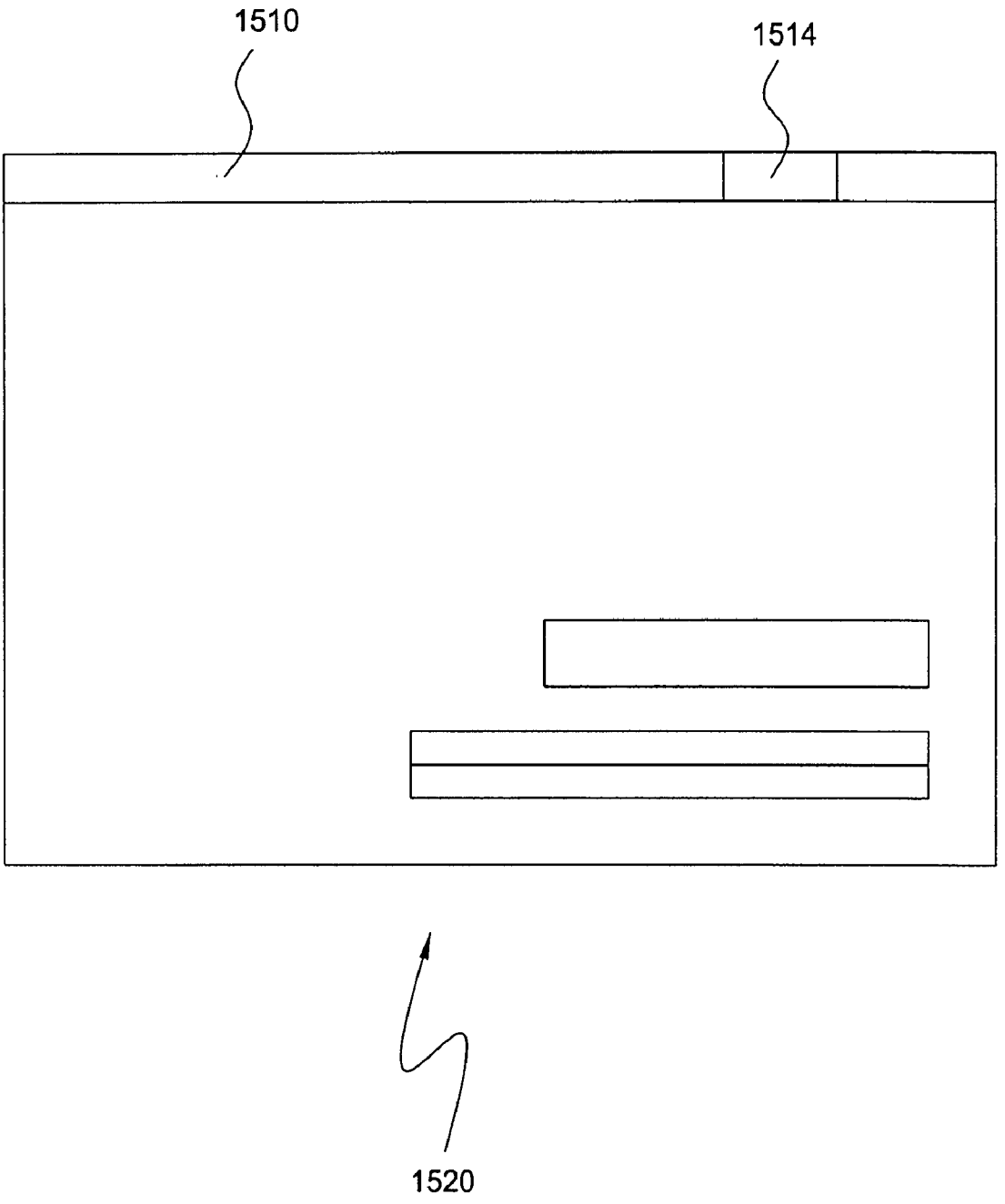


FIG. 56c

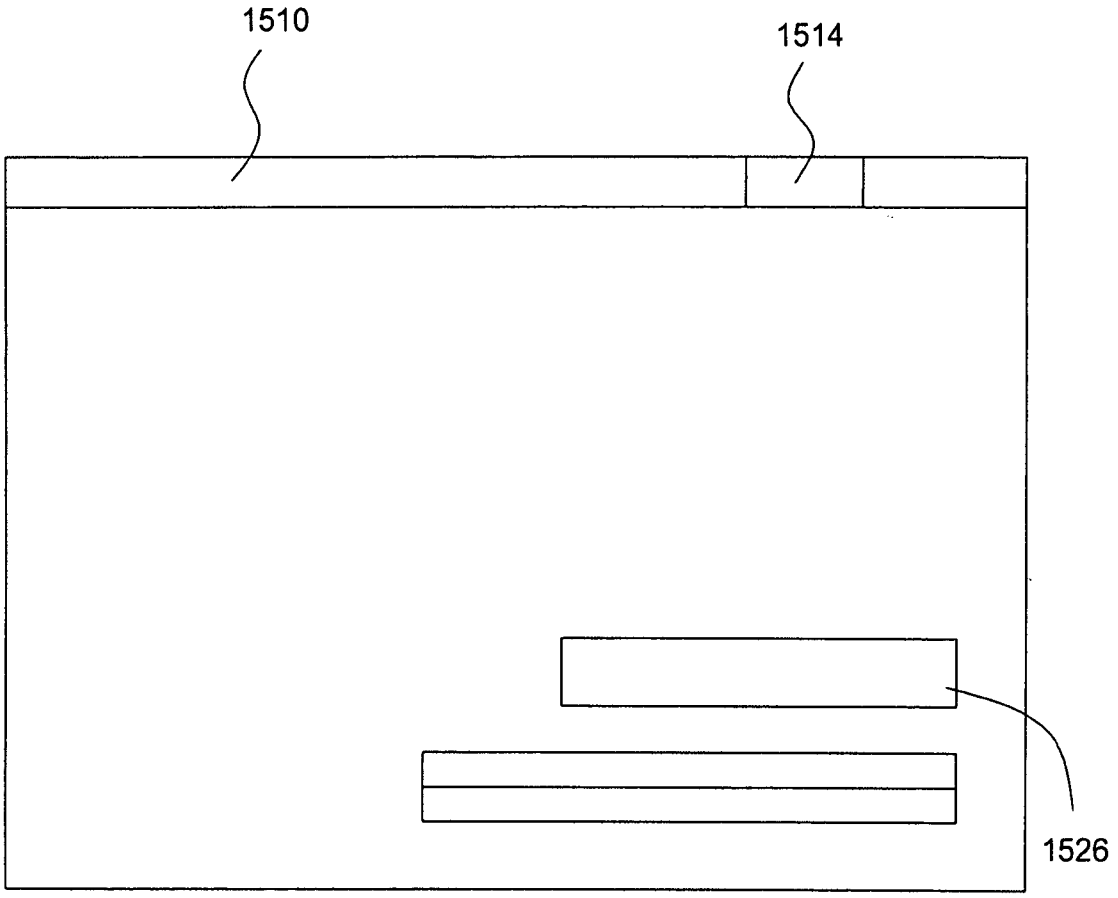


FIG. 56d

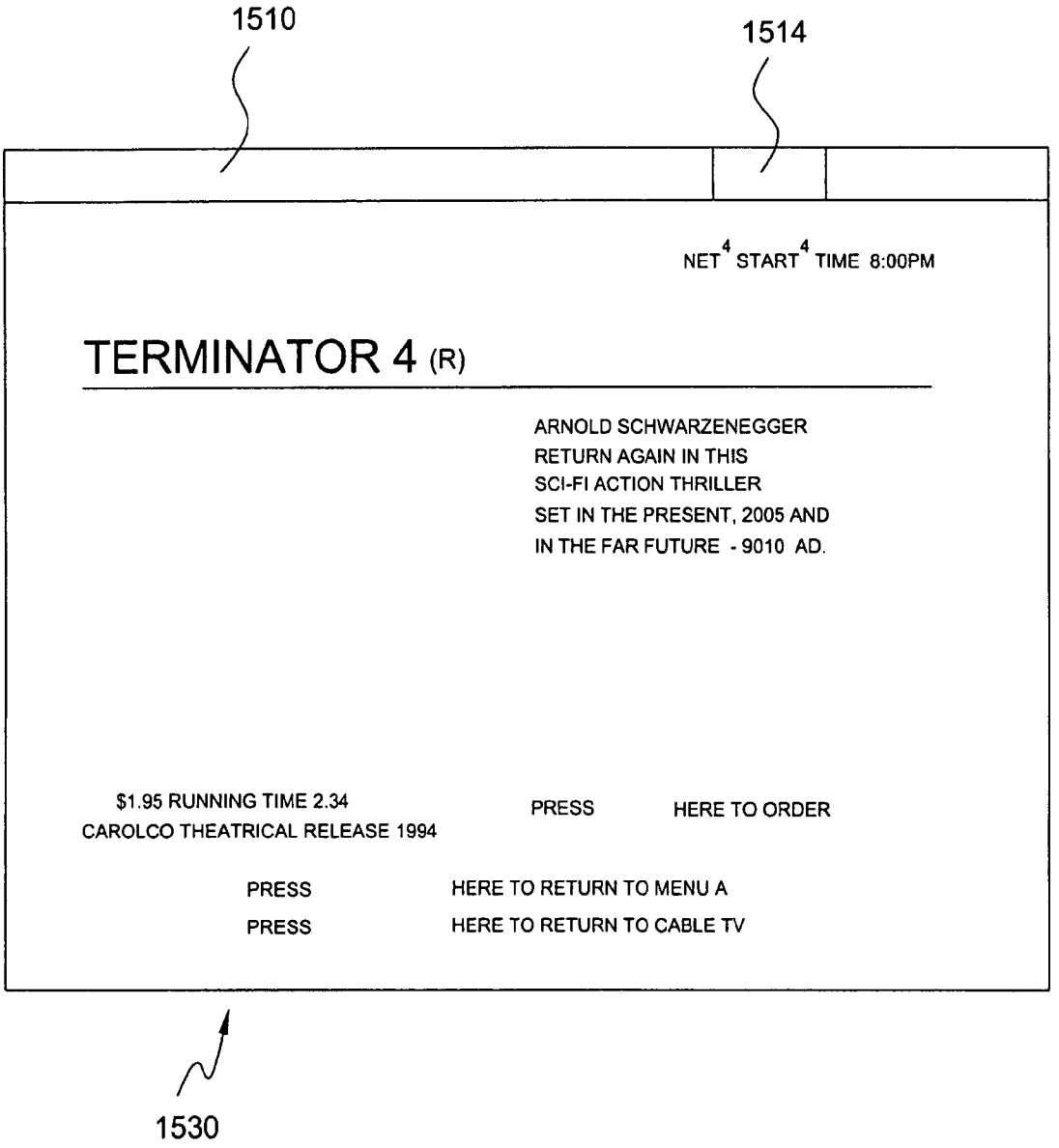

1510
1514
NET4 START4 TIME 8:00PM
TERMINATOR 4 (R)
ARNOLD SCHWARZENEGGER
RETURN AGAIN IN THIS
SCI-FI ACTION THRILLER
SET IN THE PRESENT, 2005 AND
IN THE FAR FUTURE - 9010 AD.
$1.95 RUNNING TIME 2.34
CAROLCO THEATRICAL RELEASE 1994
PRESS HERE TO ORDER
PRESS HERE TO RETURN TO MENU A
PRESS HERE TO RETURN TO CABLE TV
1530

FIG. 56e

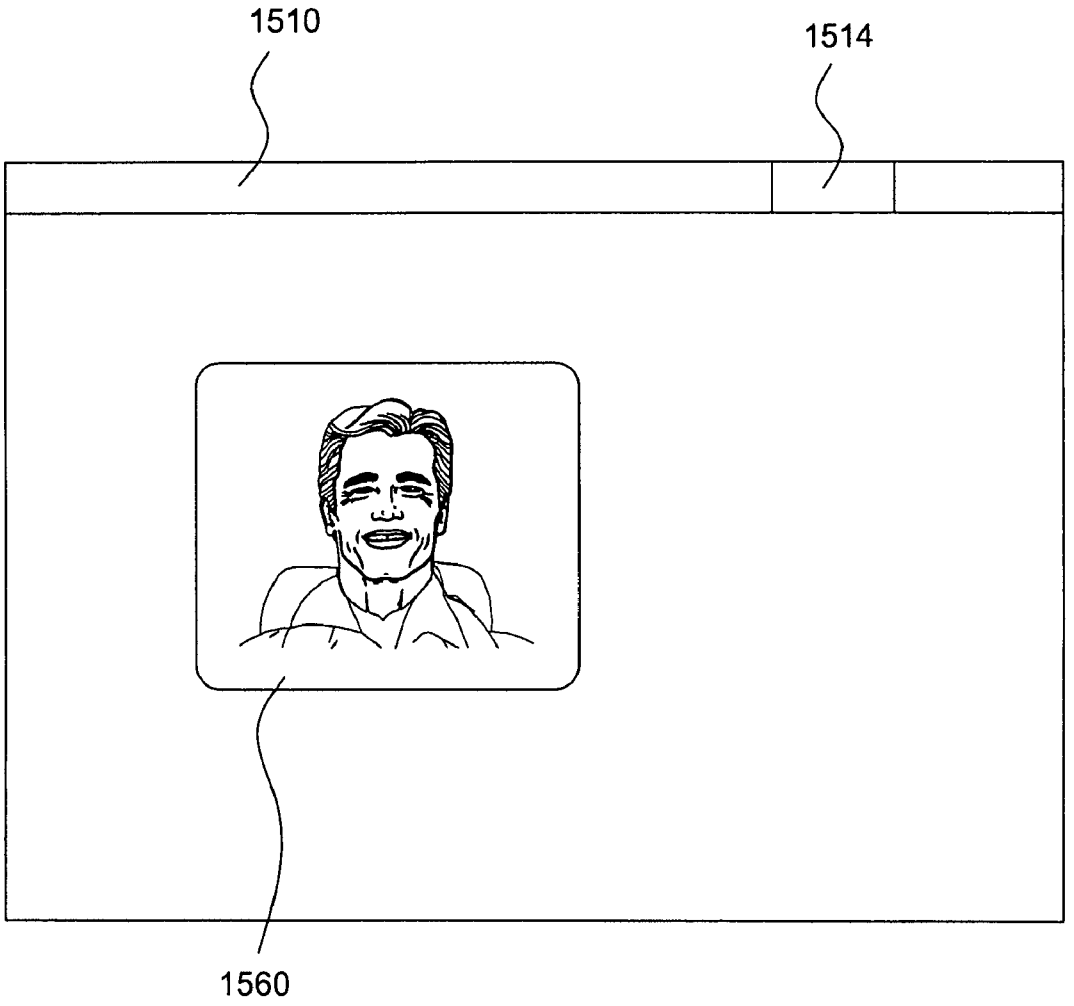
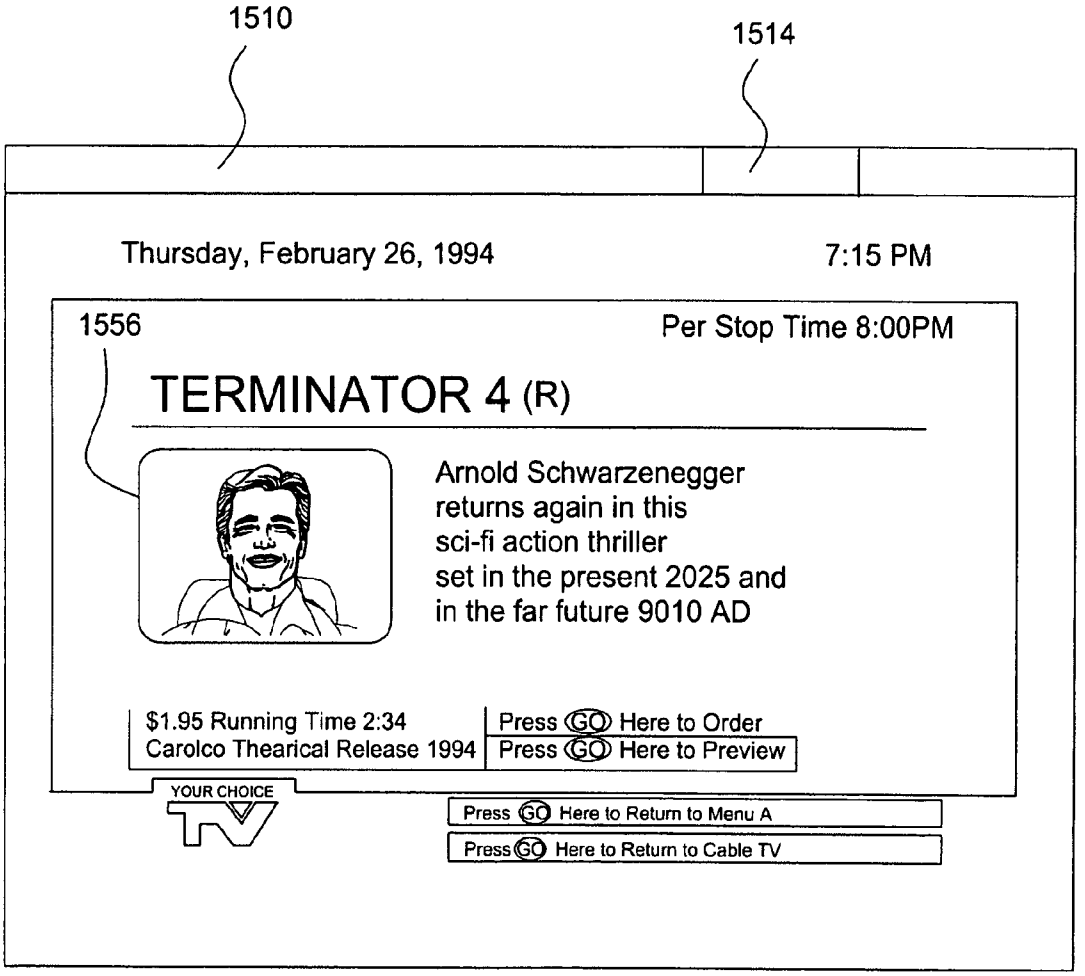


FIG. 56f


1510
1514
Thursday, February 26, 1994
7:15 PM
1556
Per Stop Time 8:00PM
TERMINATOR 4 (R)
Arnold Schwarzenegger
returns again in this
sci-fi action thriller
set in the present 2025 and
in the far future 9010 AD
$1.95 Running Time 2:34
Carolco Thearical Release 1994
Press GO Here to Order
Press GO Here to Preview
YOUR CHOICE TV
Press GO Here to Return to Menu A
Press GO Here to Return to Cable TV

1120

FIG. 56g

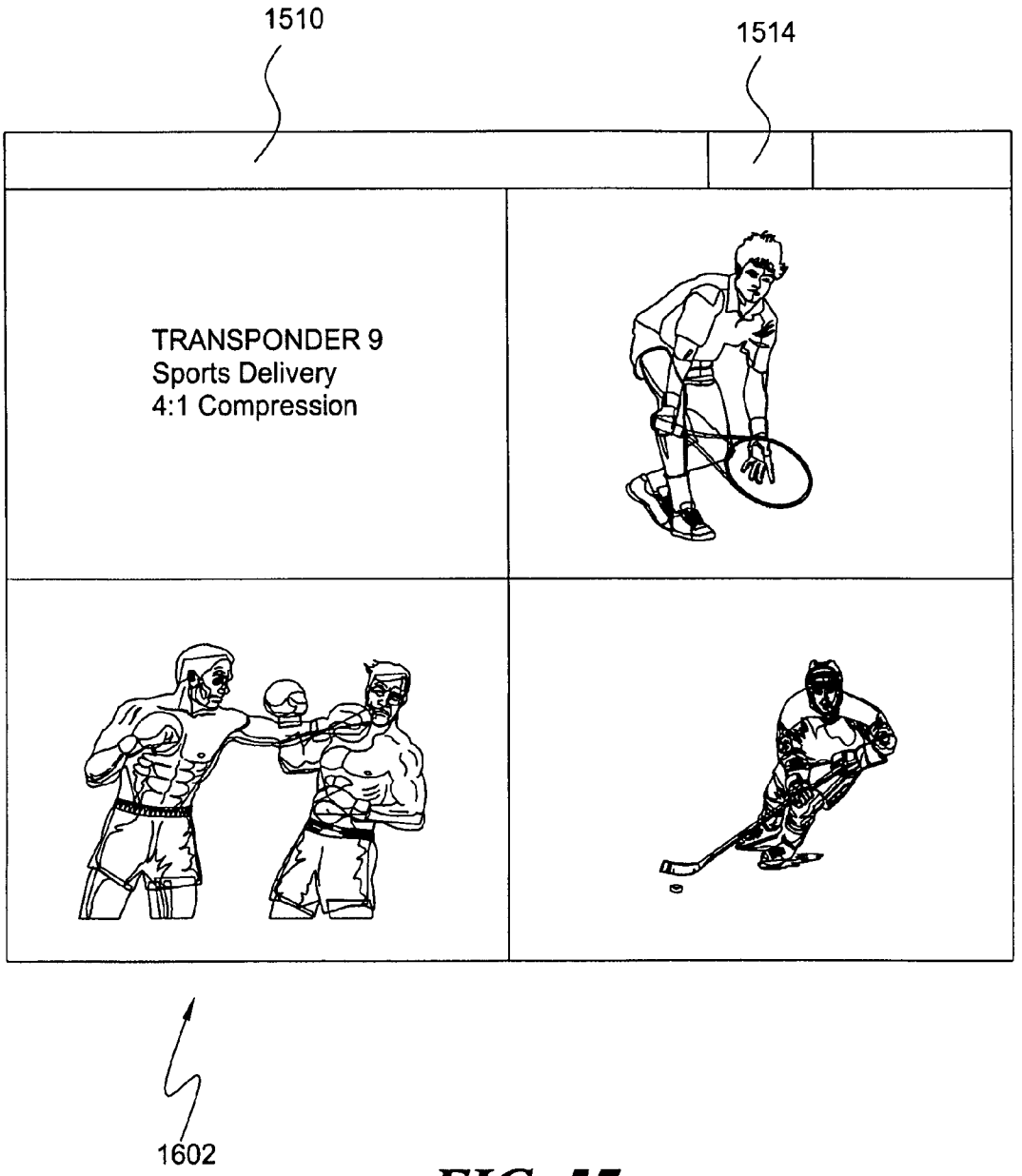

1510
1514
TRANSPONDER 9
Sports Delivery
4:1 Compression
1602

FIG. 57a

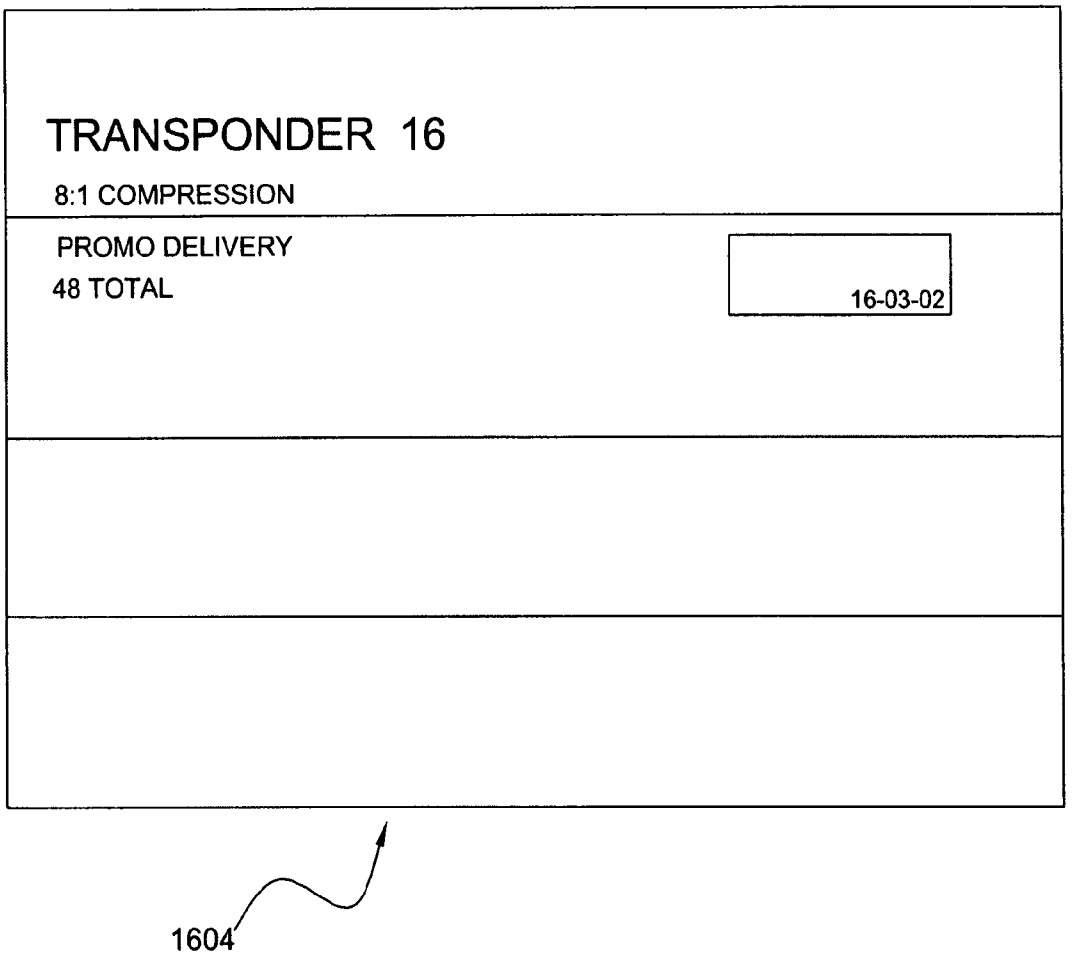
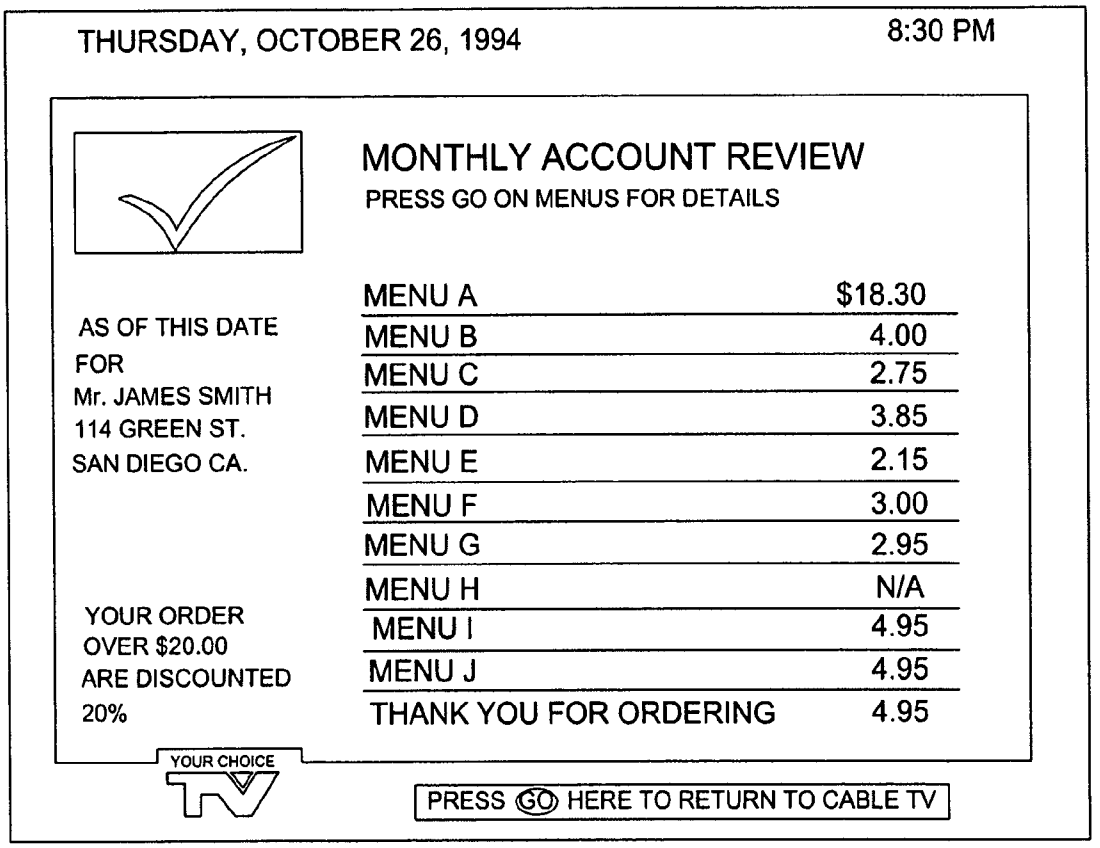

TRANSPONDER 16
8:1 COMPRESSION
PROMO DELIVERY
48 TOTAL
16-03-02
1604

FIG. 57b


THURSDAY, OCTOBER 26, 1994
8:30 PM
MONTHLY ACCOUNT REVIEW
PRESS GO ON MENUS FOR DETAILS
AS OF THIS DATE
FOR
Mr. JAMES SMITH
114 GREEN ST.
SAN DIEGO CA.
MENU A $18.30
MENU B 4.00
MENU C 2.75
MENU D 3.85
MENU E 2.15
MENU F 3.00
MENU G 2.95
MENU H N/A
MENU I 4.95
MENU J 4.95
THANK YOU FOR ORDERING 4.95
YOUR ORDER
OVER $20.00
ARE DISCOUNTED
20%
YOUR CHOICE
TV
PRESS GO HERE TO RETURN TO CABLE TV

1610

FIG. 58a

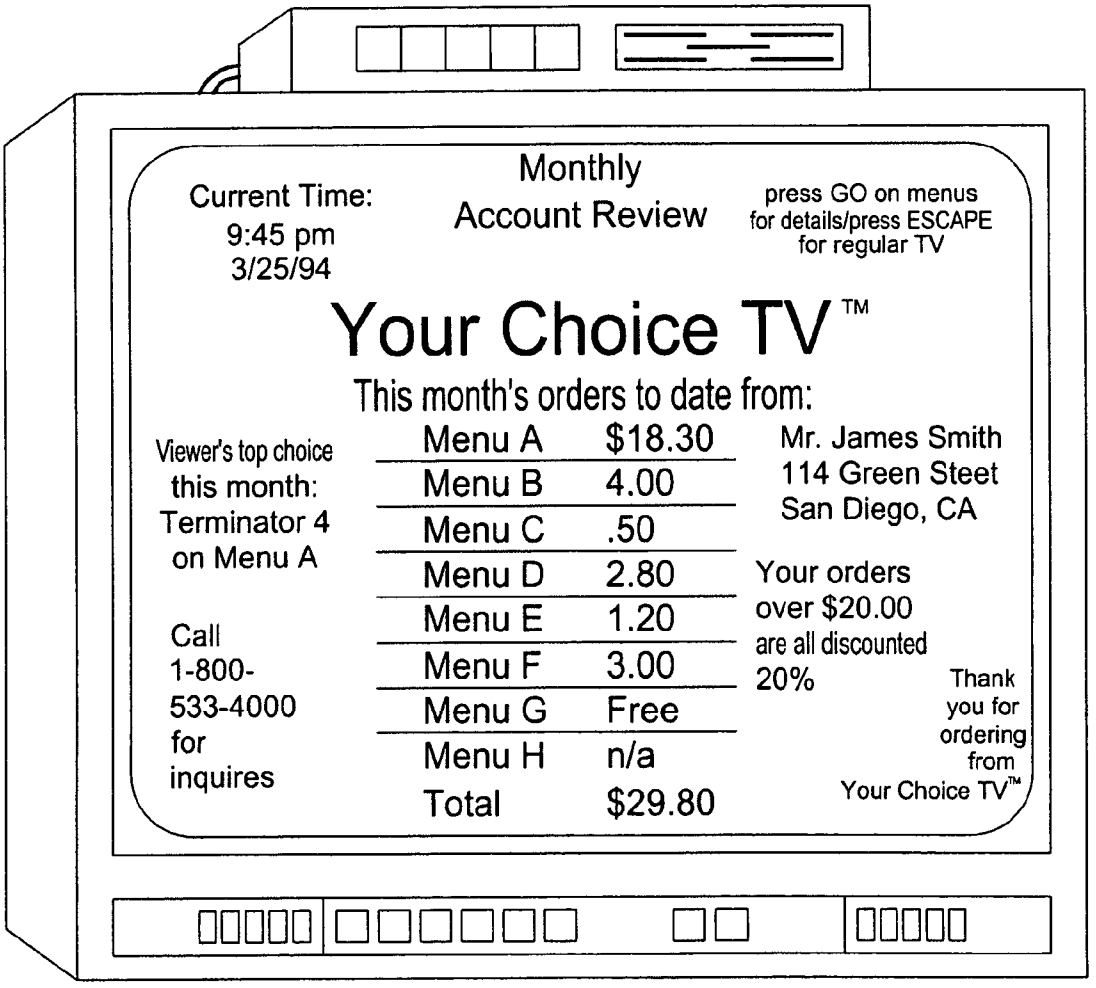

Current Time:
9:45 pm
3/25/94
Monthly
Account Review
press GO on menus
for details/press ESCAPE
for regular TV
Your Choice TV™
This month's orders to date from:
Viewer's top choice
this month:
Terminator 4
on Menu A
Call
1-800-
533-4000
for
inquires
Menu A $18.30
Menu B 4.00
Menu C .50
Menu D 2.80
Menu E 1.20
Menu F 3.00
Menu G Free
Menu H n/a
Total $29.80
Mr. James Smith
114 Green Steet
San Diego, CA
Your orders
over $20.00
are all discounted
20%
Thank
you for
ordering
from
Your Choice TV™

FIG. 58b

1612

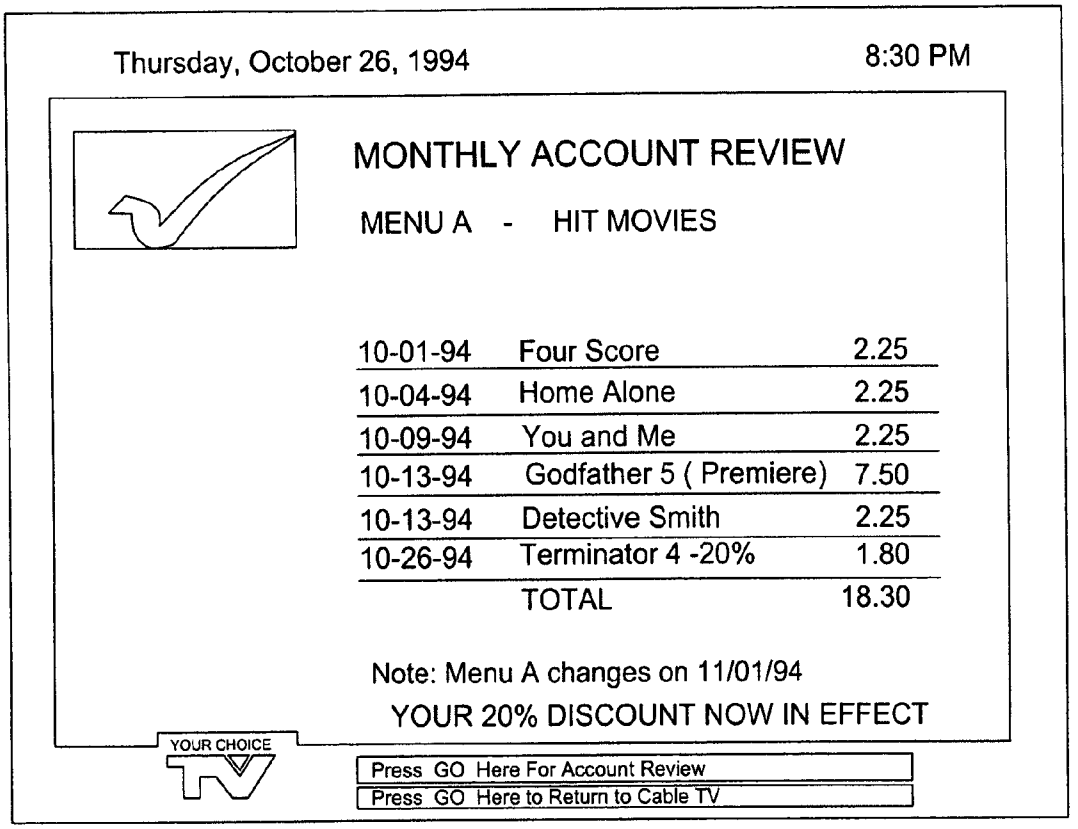

Thursday, October 26, 1994
8:30 PM
MONTHLY ACCOUNT REVIEW
MENU A - HIT MOVIES
10-01-94 Four Score 2.25
10-04-94 Home Alone 2.25
10-09-94 You and Me 2.25
10-13-94 Godfather 5 (Premiere) 7.50
10-13-94 Detective Smith 2.25
10-26-94 Terminator 4 -20% 1.80
TOTAL 18.30
Note: Menu A changes on 11/01/94
YOUR 20% DISCOUNT NOW IN EFFECT
YOUR CHOICE TV
Press GO Here For Account Review
Press GO Here to Return to Cable TV
1614

FIG. 59a

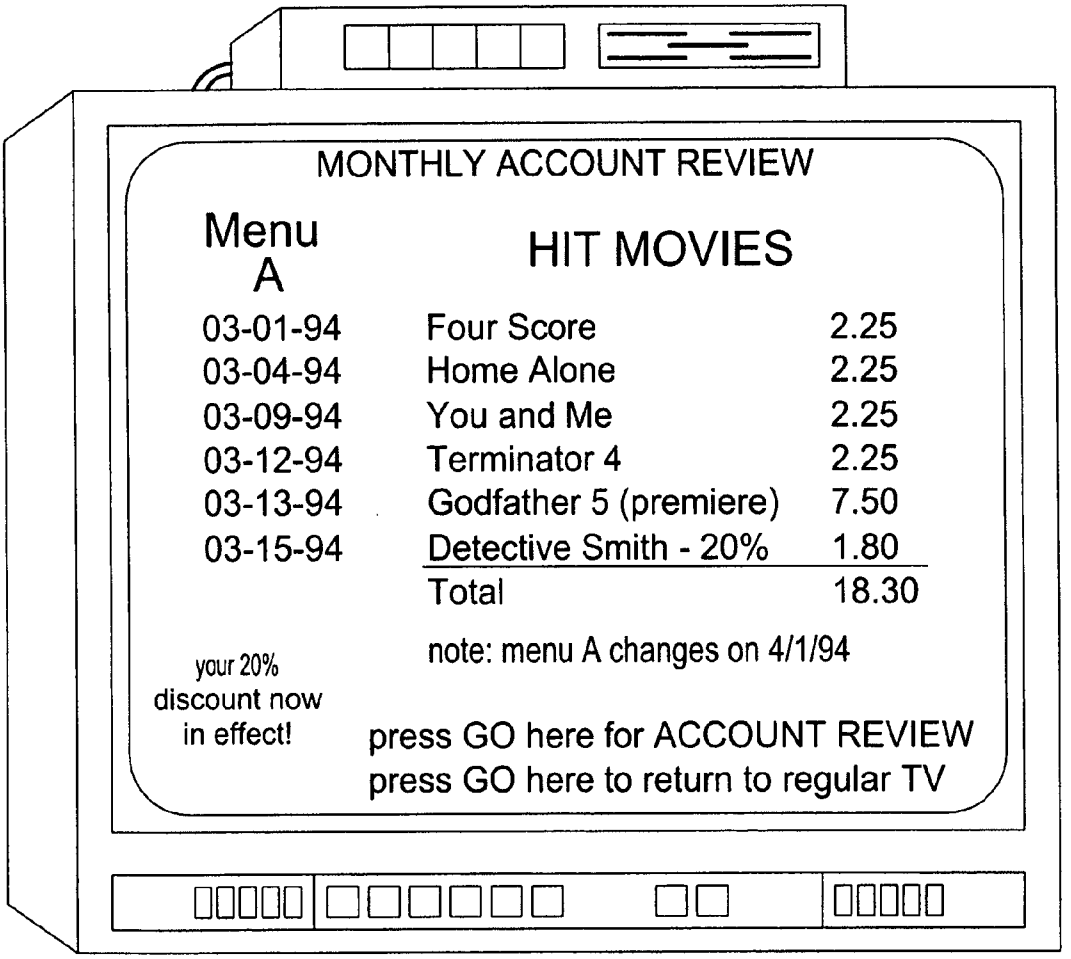

MONTHLY ACCOUNT REVIEW
Menu A
HIT MOVIES
03-01-94 Four Score 2.25
03-04-94 Home Alone 2.25
03-09-94 You and Me 2.25
03-12-94 Terminator 4 2.25
03-13-94 Godfather 5 (premiere) 7.50
03-15-94 Detective Smith - 20% 1.80
Total 18.30
note: menu A changes on 4/1/94
your 20% discount now in effect!
press GO here for ACCOUNT REVIEW
press GO here to return to regular TV

FIG. 59b

1616

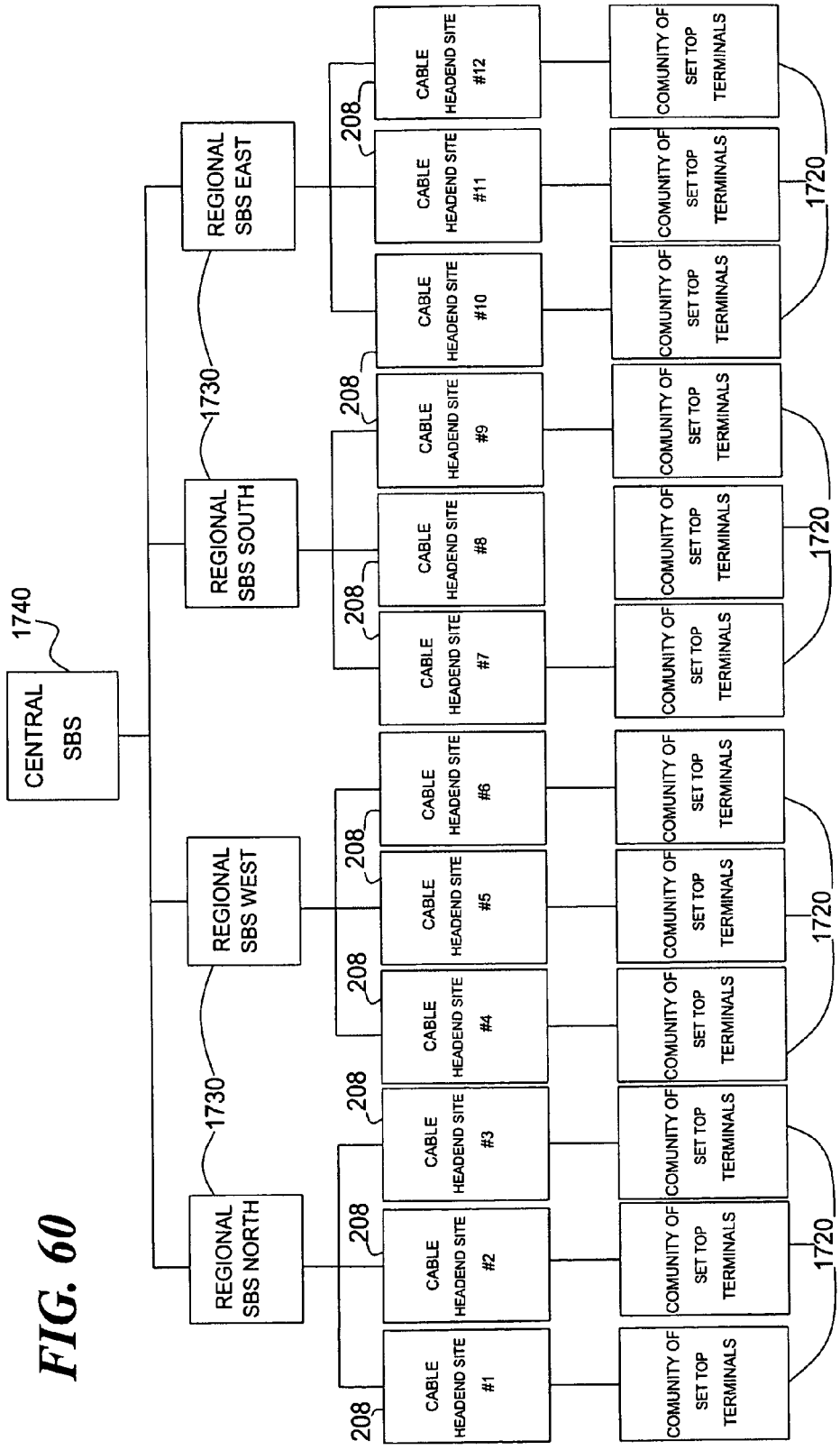

CENTRAL SBS
1740
REGIONAL SBS NORTH
REGIONAL SBS WEST
REGIONAL SBS SOUTH
REGIONAL SBS EAST
1730
1730
1730
208
CABLE HEADEND SITE #1
CABLE HEADEND SITE #2
CABLE HEADEND SITE #3
CABLE HEADEND SITE #4
CABLE HEADEND SITE #5
CABLE HEADEND SITE #6
CABLE HEADEND SITE #7
CABLE HEADEND SITE #8
CABLE HEADEND SITE #9
CABLE HEADEND SITE #10
CABLE HEADEND SITE #11
CABLE HEADEND SITE #12
COMUNITY OF SET TOP TERMINALS
1720

FIG. 60

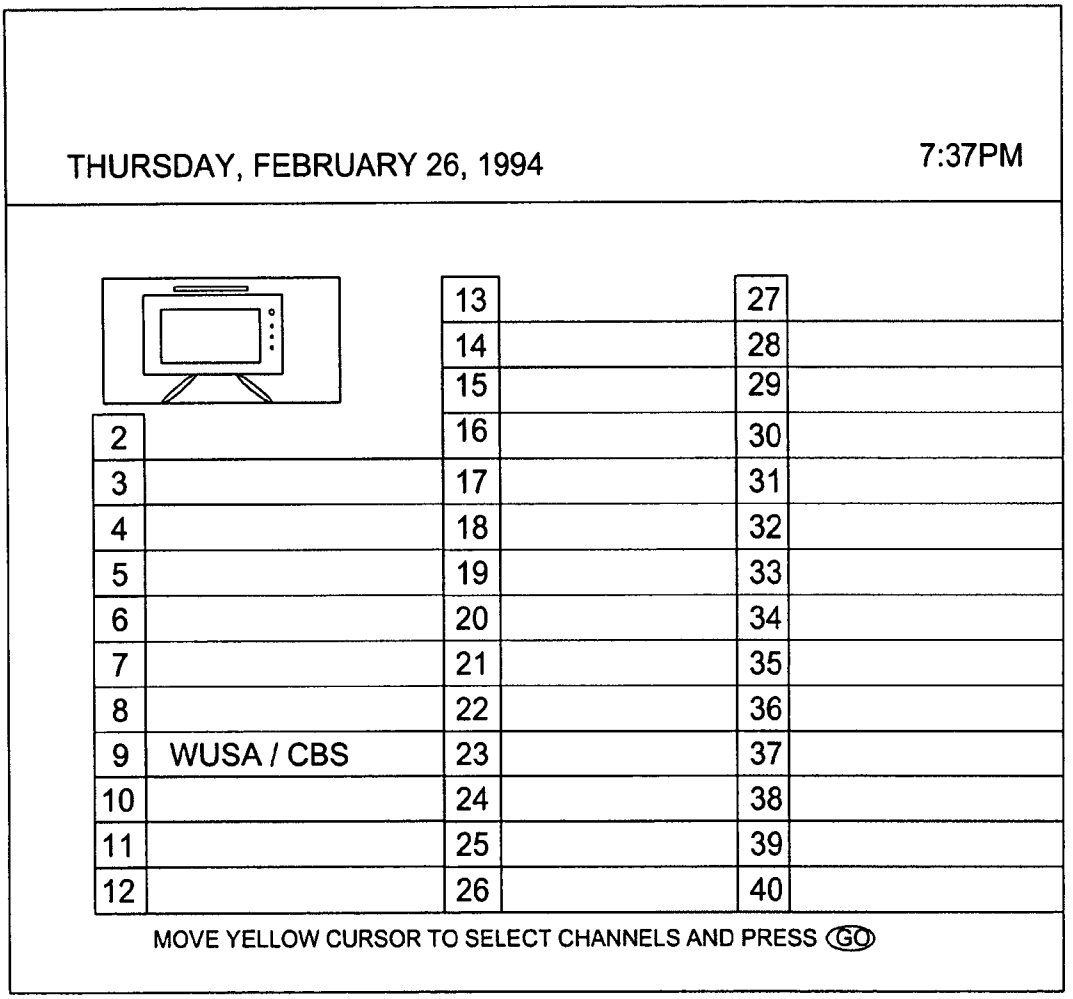

THURSDAY, FEBRUARY 26, 1994
7:37PM
2
3
4
5
6
7
8
9 WUSA / CBS
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
MOVE YELLOW CURSOR TO SELECT CHANNELS AND PRESS GO

FIG. 61

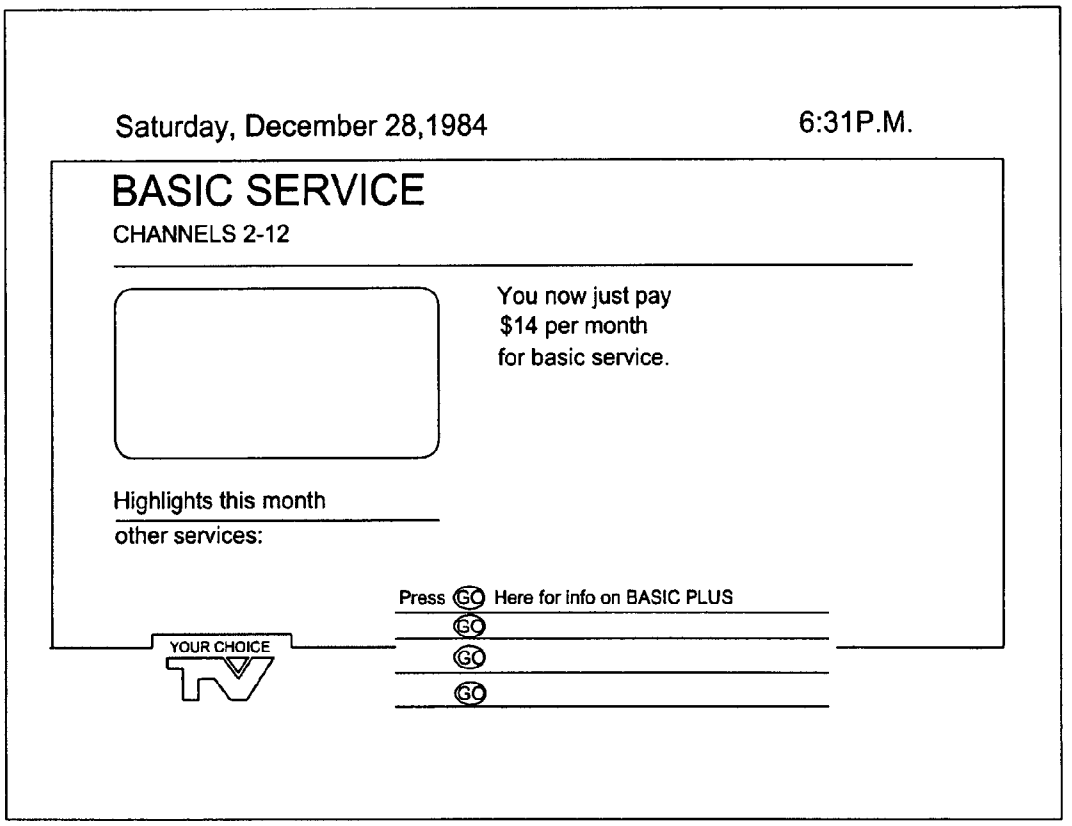

Saturday, December 28,1984
6:31P.M.
BASIC SERVICE
CHANNELS 2-12
You now just pay
$14 per month
for basic service.
Highlights this month
other services:
Press GO Here for info on BASIC PLUS
GO
GO
GO
YOUR CHOICE
TV

FIG. 62

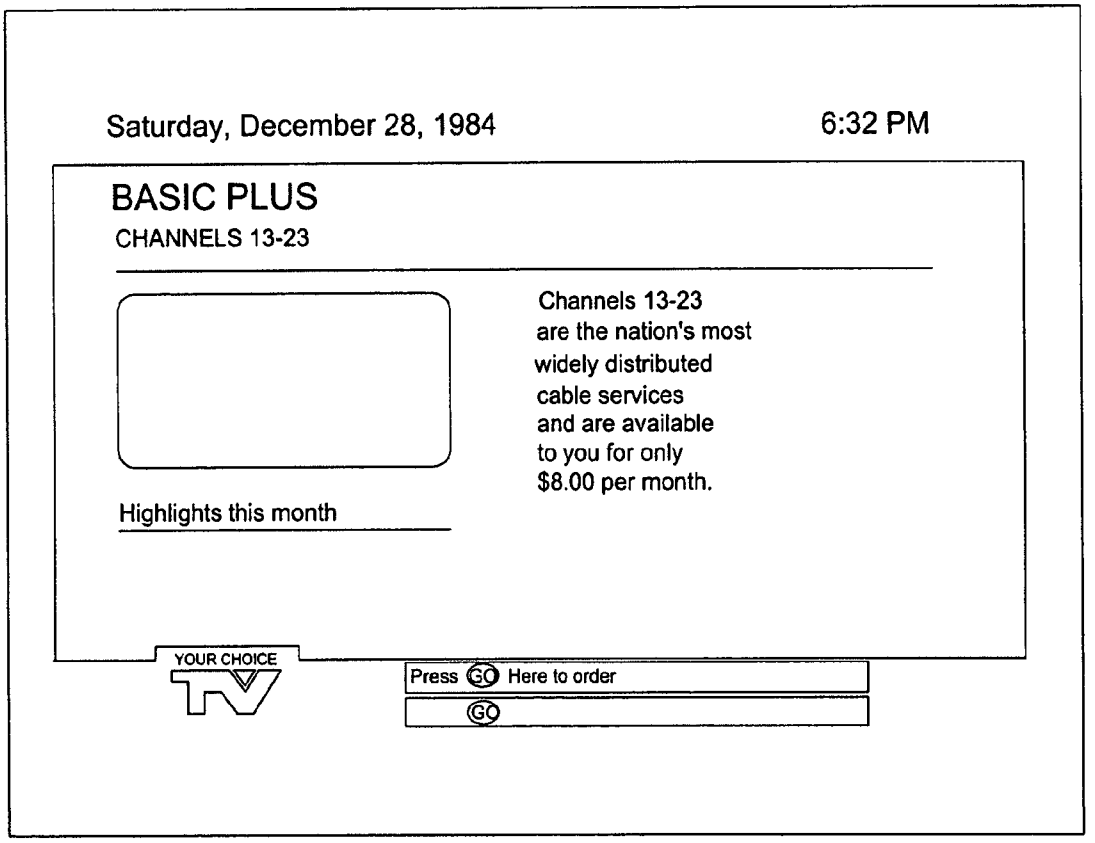

Saturday, December 28, 1984
6:32 PM
BASIC PLUS
CHANNELS 13-23
Channels 13-23
are the nation's most
widely distributed
cable services
and are available
to you for only
$8.00 per month.
Highlights this month
YOUR CHOICE
TV
Press GO Here to order
GO

FIG. 63

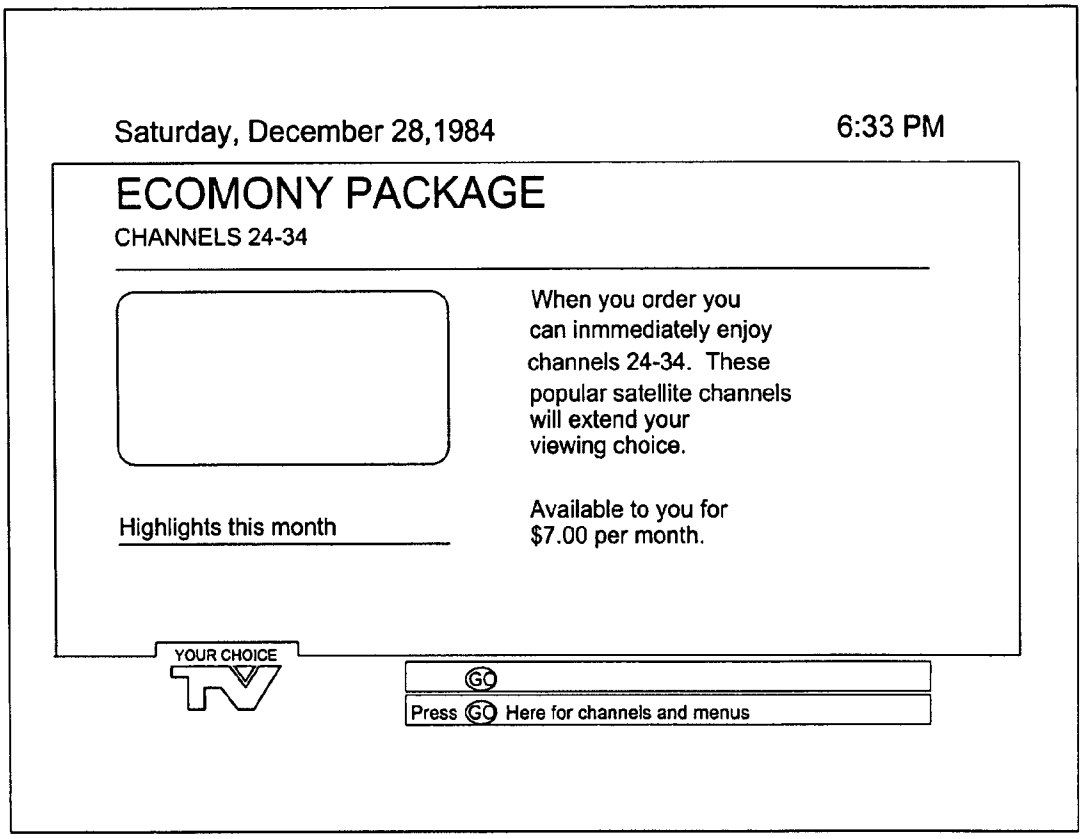

Saturday, December 28,1984
6:33 PM
ECOMONY PACKAGE
CHANNELS 24-34
When you order you can inmmediately enjoy channels 24-34. These popular satellite channels will extend your viewing choice.
Highlights this month
Available to you for $7.00 per month.
YOUR CHOICE TV
GO
Press GO Here for channels and menus

FIG. 64

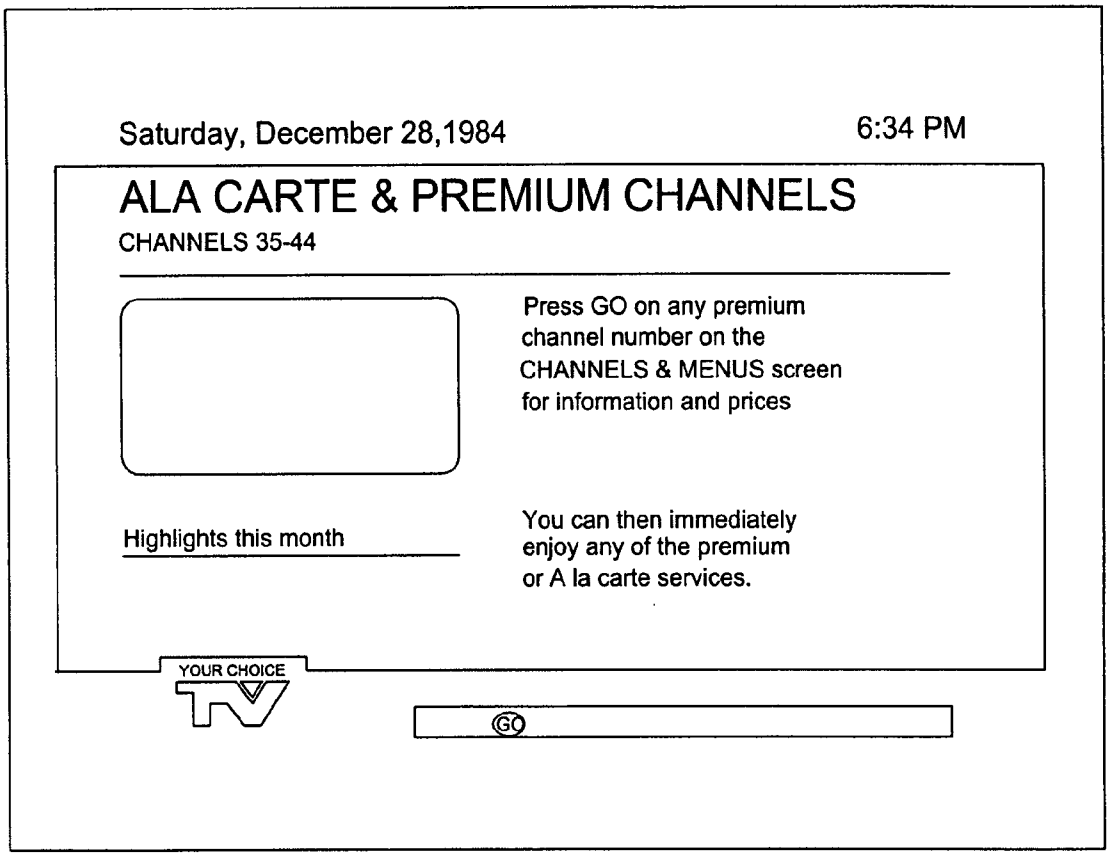

Saturday, December 28,1984
6:34 PM
ALA CARTE & PREMIUM CHANNELS
CHANNELS 35-44
Press GO on any premium channel number on the CHANNELS & MENUS screen for information and prices
Highlights this month
You can then immediately enjoy any of the premium or A la carte services.
YOUR CHOICE TV
GO

FIG. 65

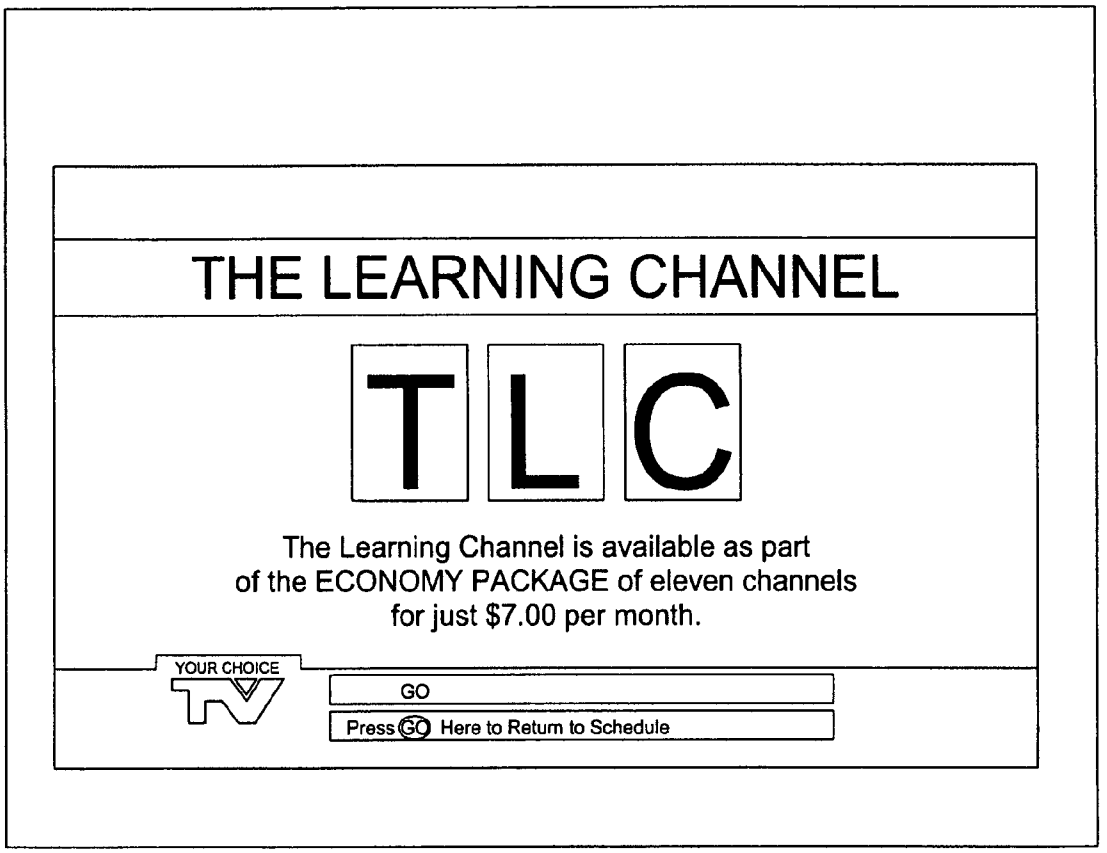

THE LEARNING CHANNEL
T L C
The Learning Channel is available as part
of the ECONOMY PACKAGE of eleven channels
for just $7.00 per month.
YOUR CHOICE TV
GO
Press GO Here to Return to Schedule

FIG. 66

SATURDAY, DECEMBER 28, 1984 6:30 PM

	BASIC		BASIC PLUS				
2	CBS	13	CNN	24	VH1		
3	NBC	14	CNN	25	TLC	35	SCI-FI
4	NBC	15	DISC	26	AMC	36	TOON
5	ABC	16	ESPN	27	TNN	37	BRAV
6	ABC	17	TBS	28	MEU	38	ROM
7	FOX	18	TNT	29	EI	39	ENCR
8	PBS	19	USA	30	CNBC	40	DISN
9	WTFC	20	FAM	31	LIFE	41	CINE
10	WKN	21	NICK	32	A&E	42	TMC
11	WYAB	22	MTV	33	COURT	43	SHOW
12	C-SPAN	23	TWC	34	TRAV	44	HBO

PRESS GO ABOVE FOR CHANNELS PRESS GO BELOW FOR MENUS PRESS GO ON □ FOR INFO/PRICES

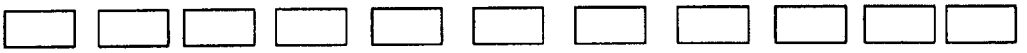


FIG. 67

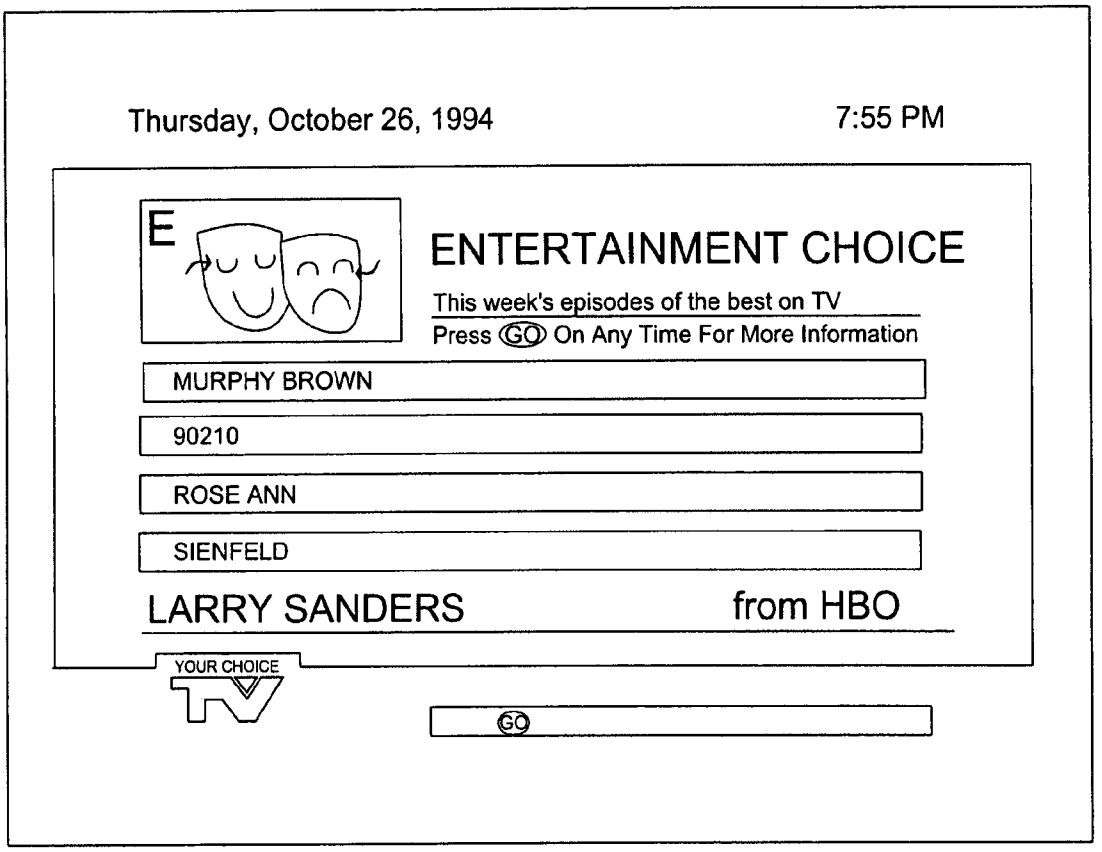

Thursday, October 26, 1994
7:55 PM
E
ENTERTAINMENT CHOICE
This week's episodes of the best on TV
Press GO On Any Time For More Information
MURPHY BROWN
90210
ROSE ANN
SIENFELD
LARRY SANDERS
from HBO
YOUR CHOICE TV
GO

FIG. 68

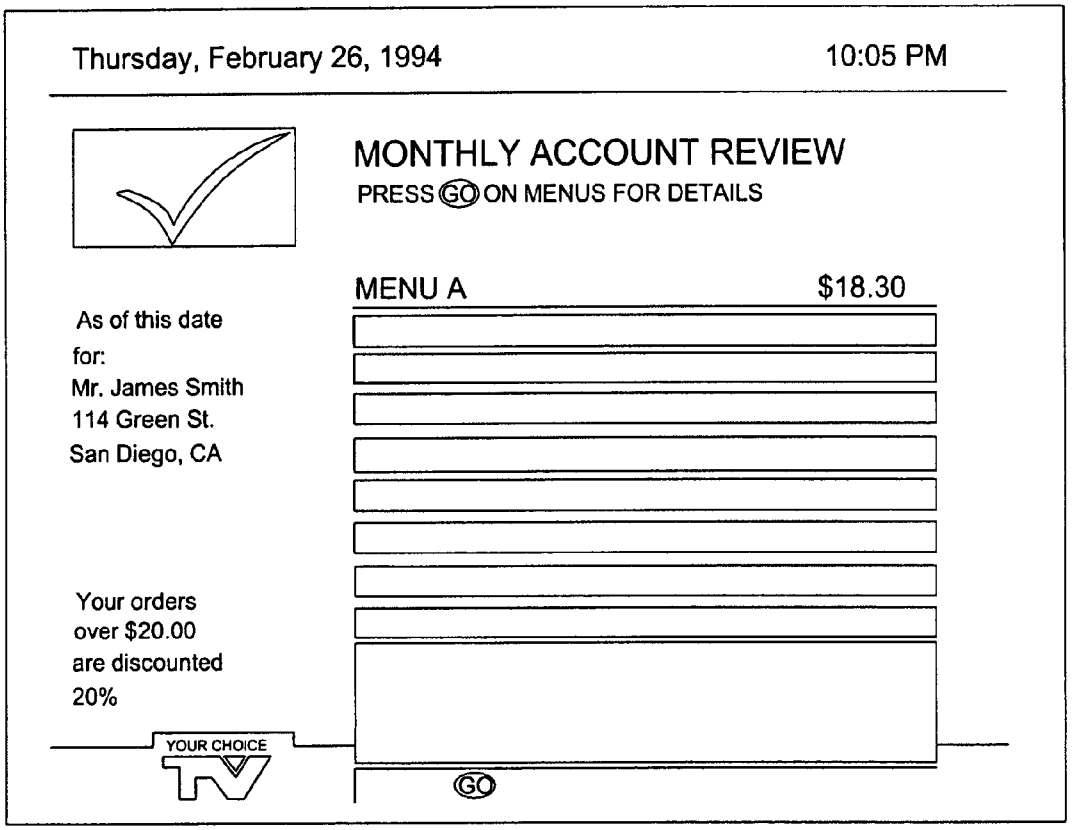

Thursday, February 26, 1994
10:05 PM
MONTHLY ACCOUNT REVIEW
PRESS GO ON MENUS FOR DETAILS
MENU A
$18.30
As of this date
for:
Mr. James Smith
114 Green St.
San Diego, CA
Your orders
over $20.00
are discounted
20%
YOUR CHOICE
TV
GO

FIG. 69

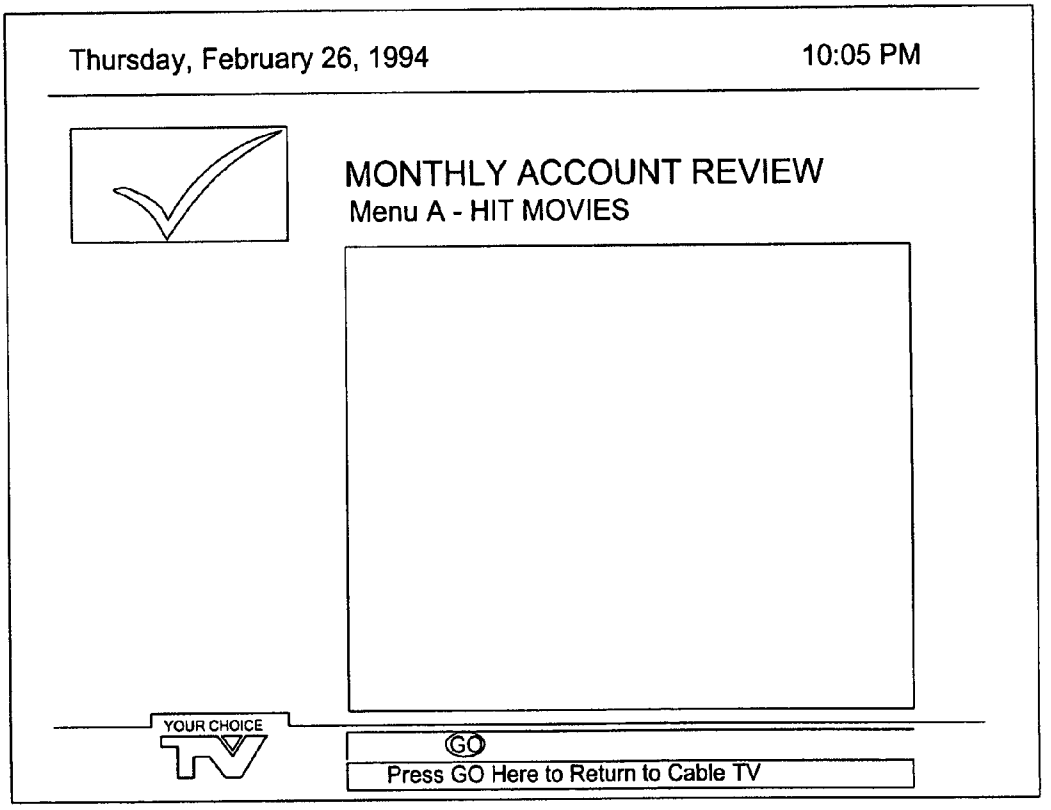

Thursday, February 26, 1994
10:05 PM
MONTHLY ACCOUNT REVIEW
Menu A - HIT MOVIES
YOUR CHOICE TV
GO
Press GO Here to Return to Cable TV

FIG. 70

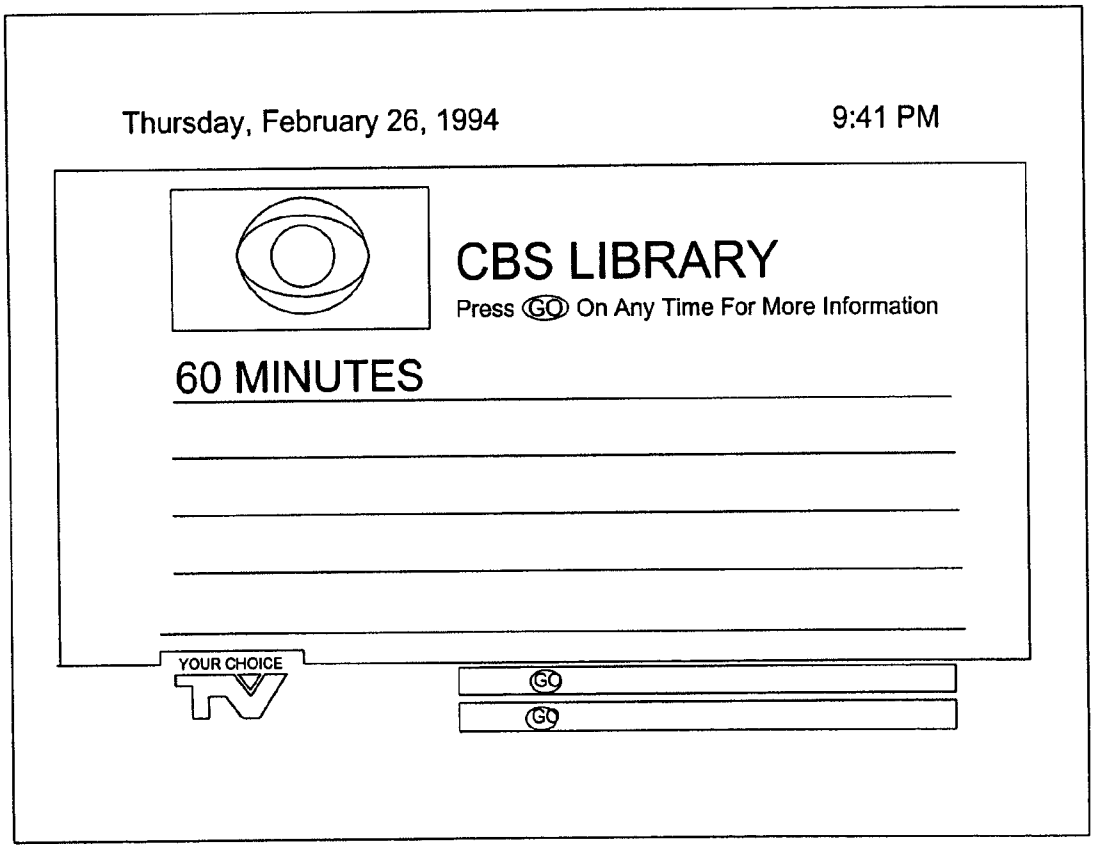

Thursday, February 26, 1994
9:41 PM
CBS LIBRARY
Press GO On Any Time For More Information
60 MINUTES
YOUR CHOICE TV
GO
GO

FIG. 71

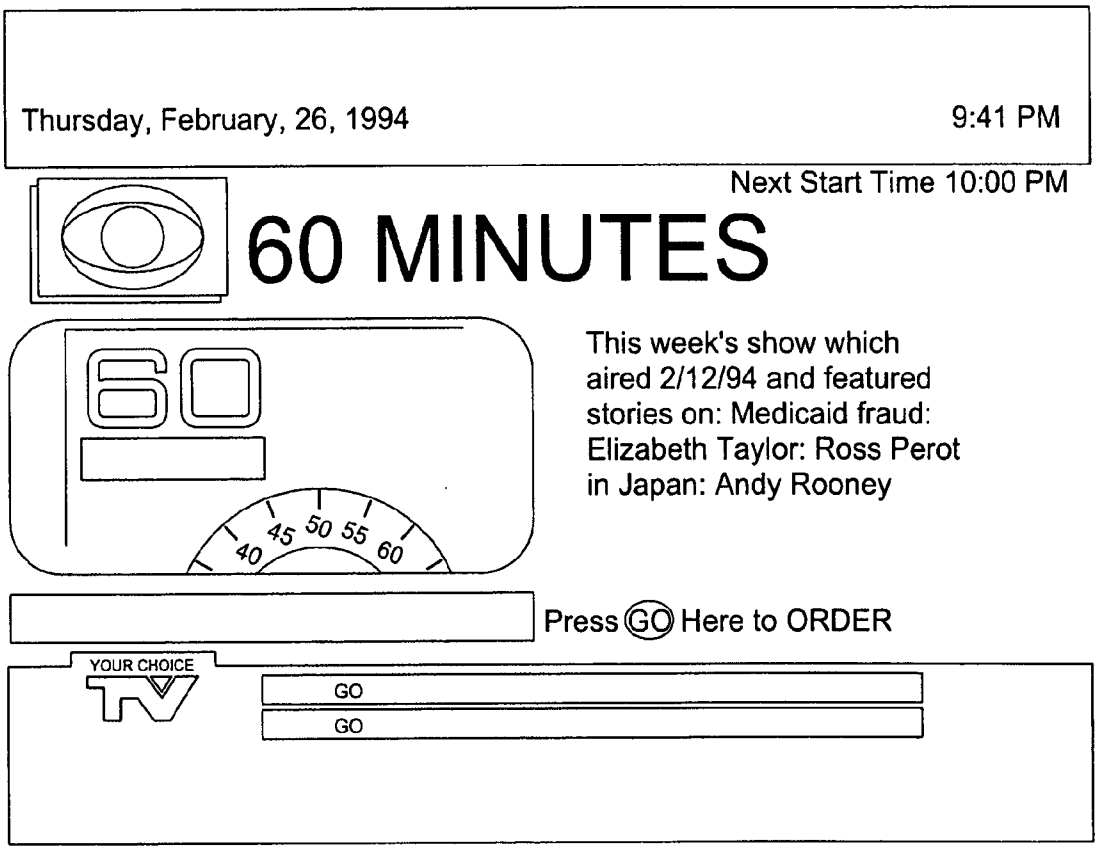

Thursday, February, 26, 1994
9:41 PM
Next Start Time 10:00 PM
60 MINUTES
60
40
45
50
55
60
This week's show which aired 2/12/94 and featured stories on: Medicaid fraud: Elizabeth Taylor: Ross Perot in Japan: Andy Rooney
Press GO Here to ORDER
YOUR CHOICE TV
GO
GO

FIG. 72

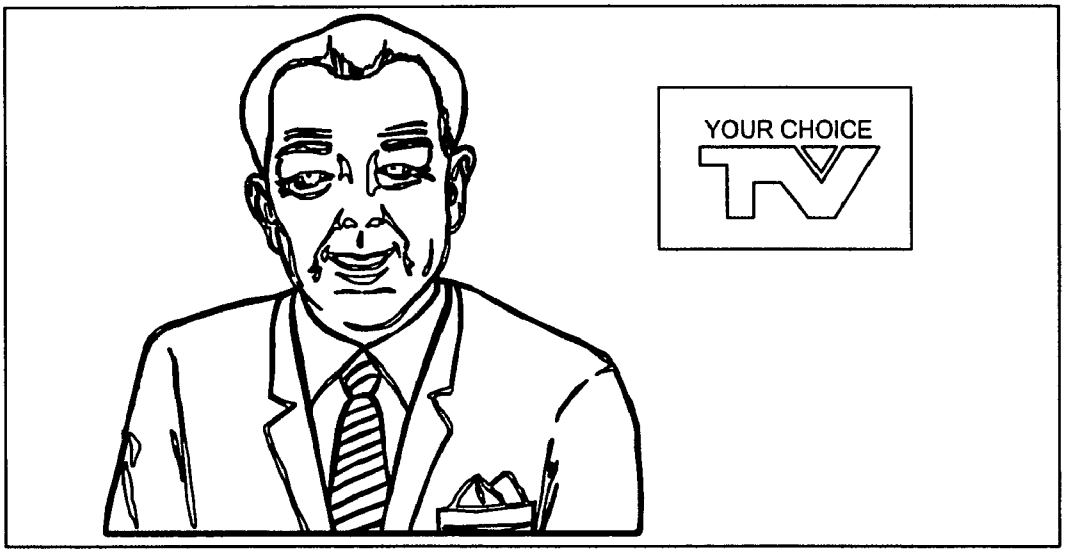


FIG. 73

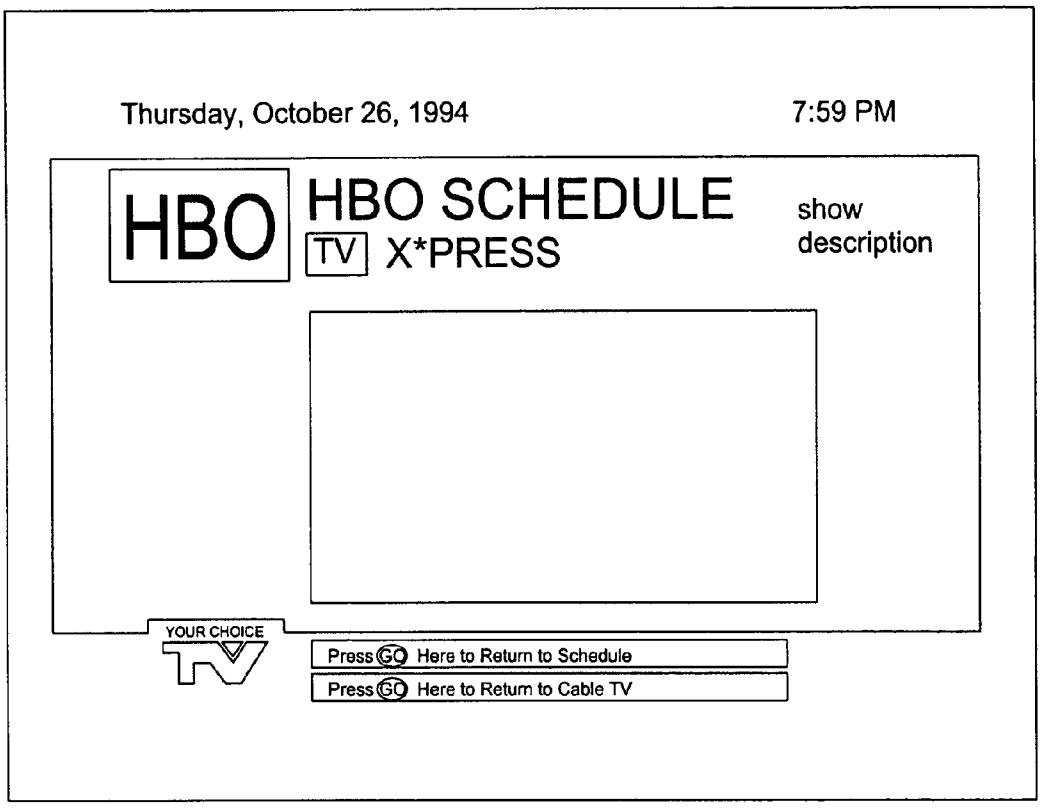

Thursday, October 26, 1994
7:59 PM
HBO
HBO SCHEDULE
TV X*PRESS
show
description
YOUR CHOICE
TV
Press GO Here to Return to Schedule
Press GO Here to Return to Cable TV

FIG. 74

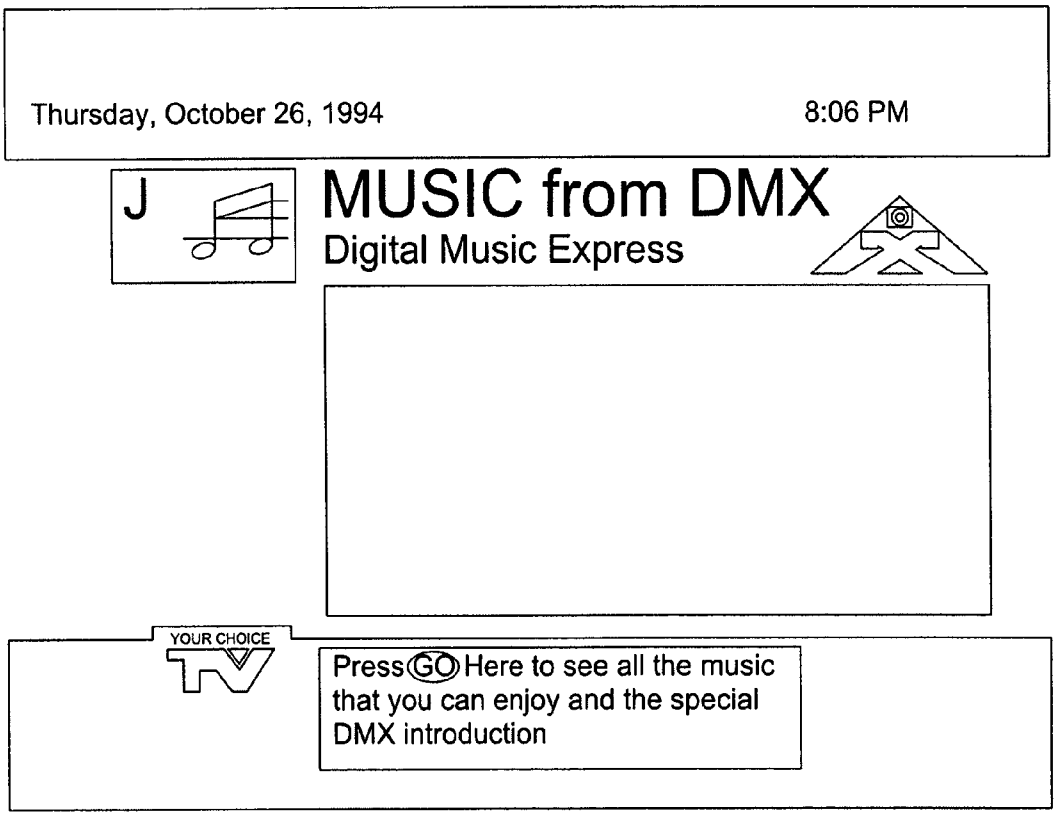

Thursday, October 26, 1994
8:06 PM
J
MUSIC from DMX
Digital Music Express
YOUR CHOICE
TV
Press GO Here to see all the music that you can enjoy and the special DMX introduction

FIG. 75

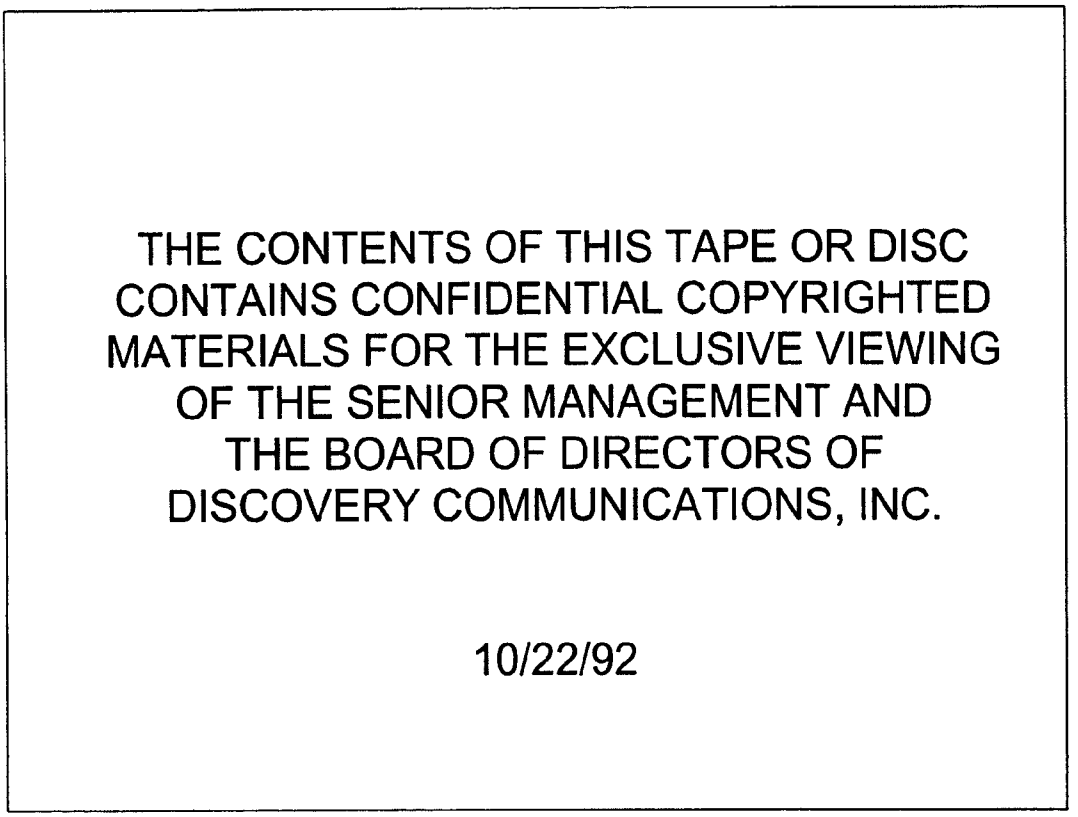

THE CONTENTS OF THIS TAPE OR DISC
CONTAINS CONFIDENTIAL COPYRIGHTED
MATERIALS FOR THE EXCLUSIVE VIEWING
OF THE SENIOR MANAGEMENT AND
THE BOARD OF DIRECTORS OF
DISCOVERY COMMUNICATIONS, INC.
10/22/92

FIG. 76

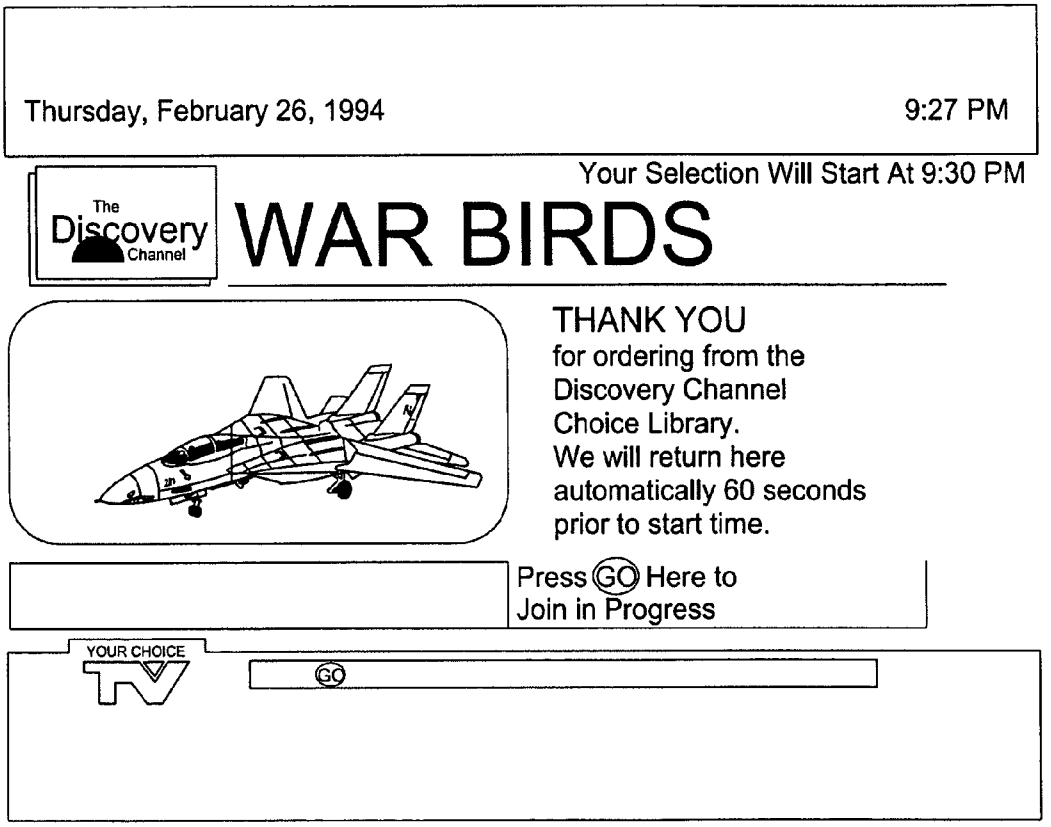

Thursday, February 26, 1994
9:27 PM
Your Selection Will Start At 9:30 PM
The Discovery Channel
WAR BIRDS
THANK YOU
for ordering from the
Discovery Channel
Choice Library.
We will return here
automatically 60 seconds
prior to start time.
Press GO Here to
Join in Progress
YOUR CHOICE TV
GO

FIG. 77

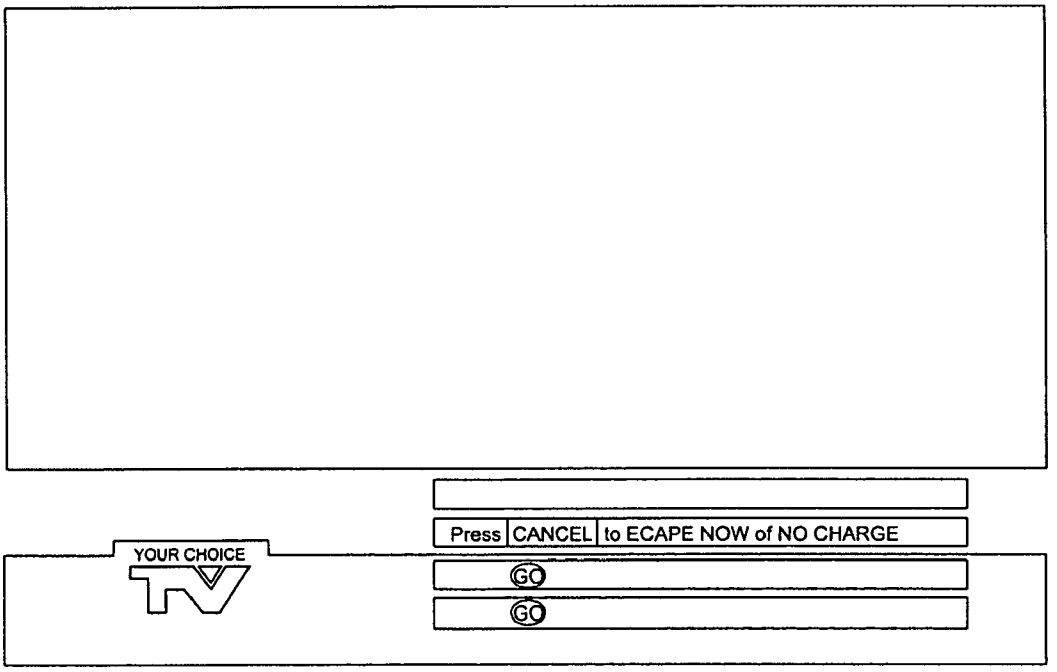


FIG. 78

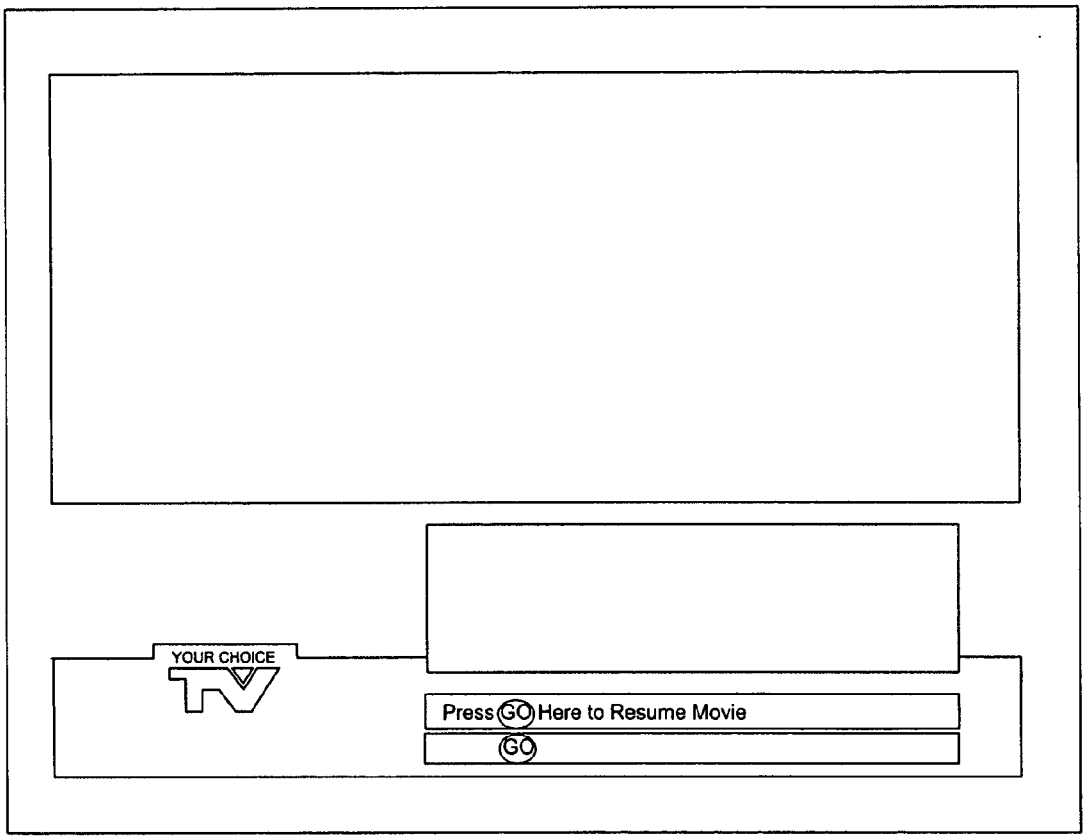


FIG. 79

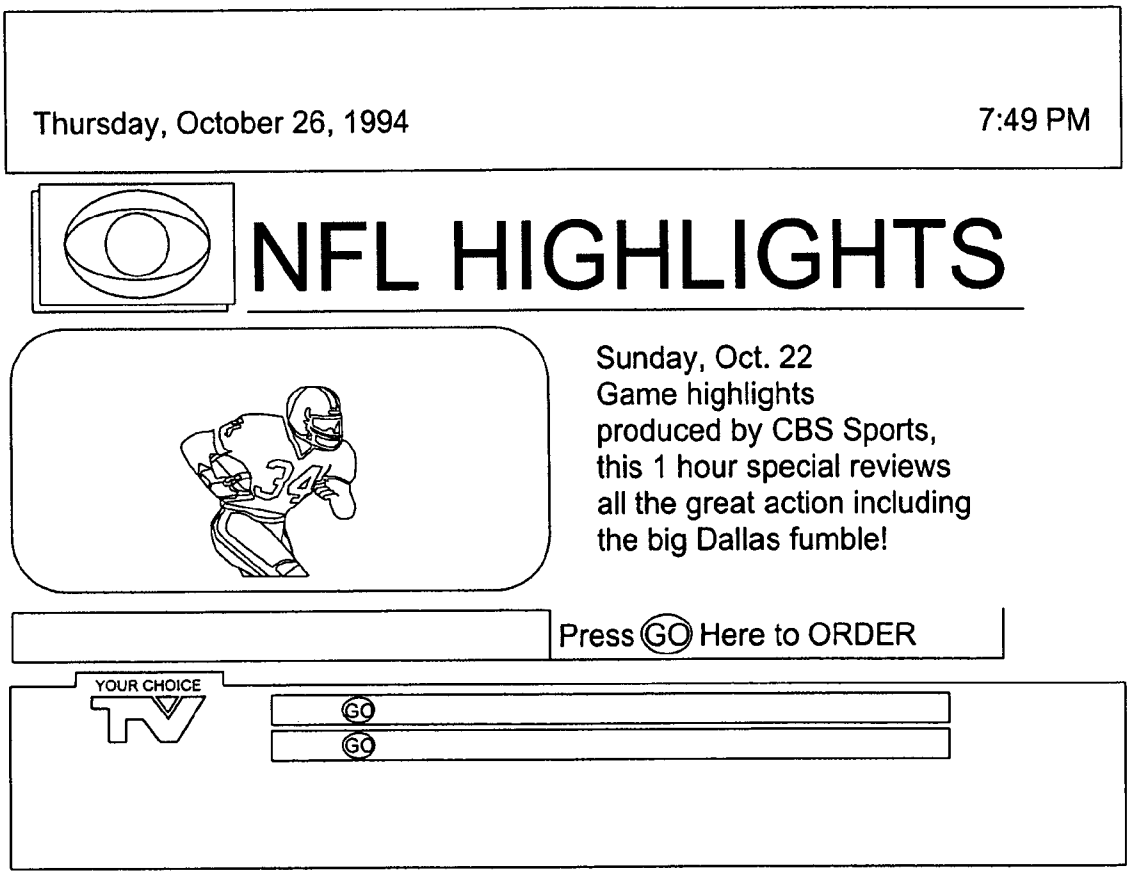

Thursday, October 26, 1994
7:49 PM
NFL HIGHLIGHTS
Sunday, Oct. 22
Game highlights
produced by CBS Sports,
this 1 hour special reviews
all the great action including
the big Dallas fumble!
Press GO Here to ORDER
YOUR CHOICE TV
GO
GO

FIG. 80

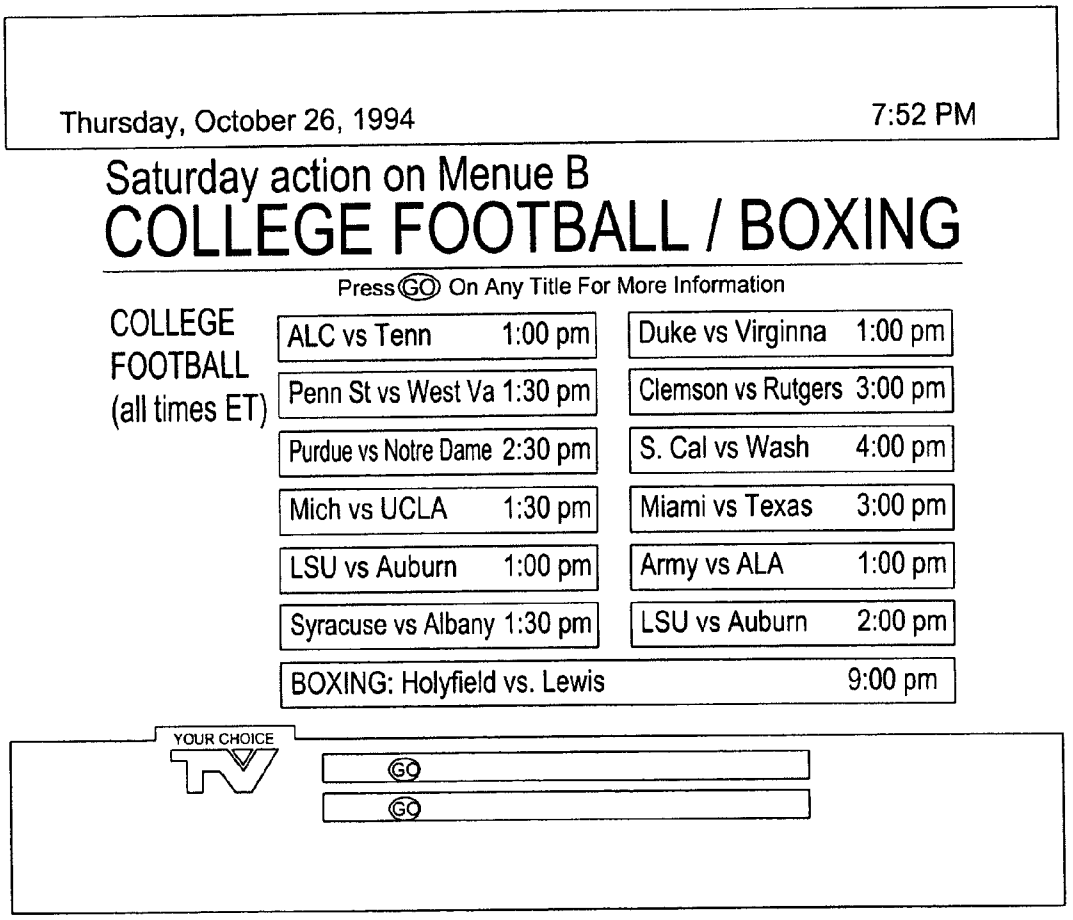

Thursday, October 26, 1994
7:52 PM
Saturday action on Menue B
COLLEGE FOOTBALL / BOXING
Press GO On Any Title For More Information
COLLEGE FOOTBALL (all times ET)
ALC vs Tenn 1:00 pm
Penn St vs West Va 1:30 pm
Purdue vs Notre Dame 2:30 pm
Mich vs UCLA 1:30 pm
LSU vs Auburn 1:00 pm
Syracuse vs Albany 1:30 pm
Duke vs Virginna 1:00 pm
Clemson vs Rutgers 3:00 pm
S. Cal vs Wash 4:00 pm
Miami vs Texas 3:00 pm
Army vs ALA 1:00 pm
LSU vs Auburn 2:00 pm
BOXING: Holyfield vs. Lewis 9:00 pm
YOUR CHOICE TV
GO
GO

FIG. 81

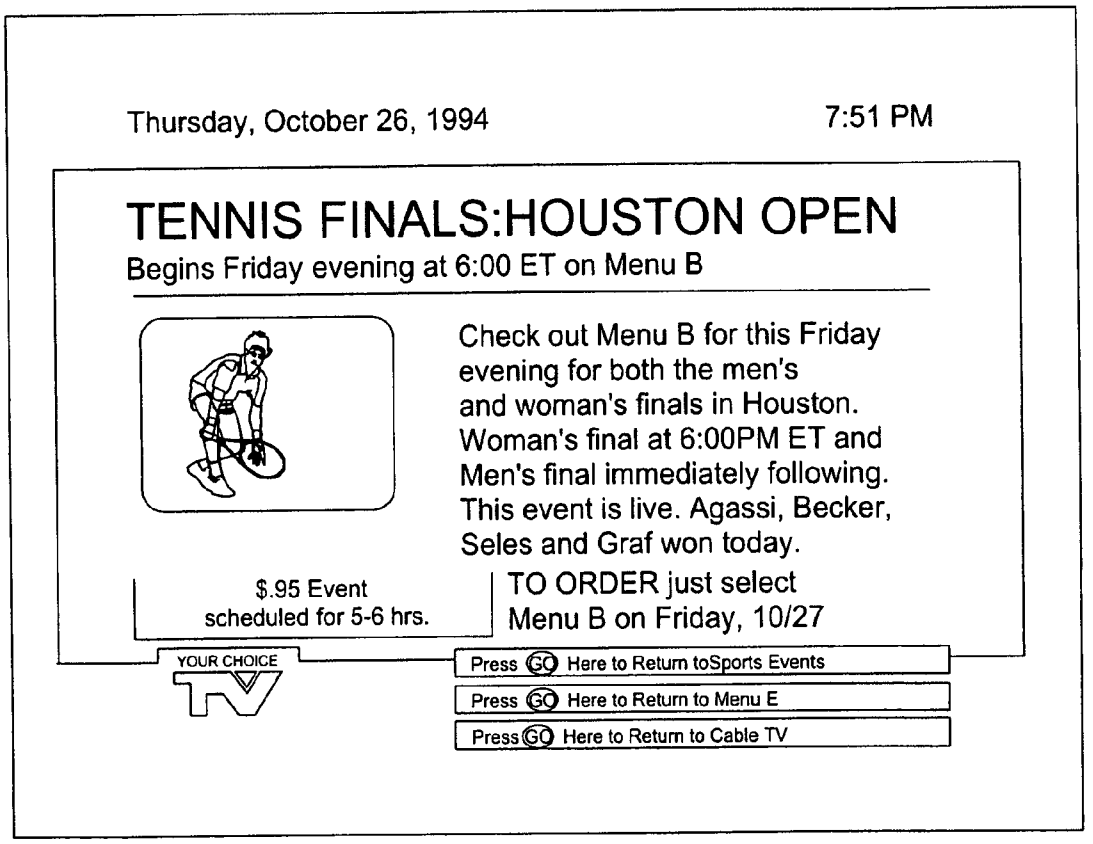

Thursday, October 26, 1994
7:51 PM
TENNIS FINALS:HOUSTON OPEN
Begins Friday evening at 6:00 ET on Menu B
Check out Menu B for this Friday evening for both the men's and woman's finals in Houston. Woman's final at 6:00PM ET and Men's final immediately following. This event is live. Agassi, Becker, Seles and Graf won today.
$.95 Event scheduled for 5-6 hrs.
TO ORDER just select Menu B on Friday, 10/27
YOUR CHOICE TV
Press GO Here to Return toSports Events
Press GO Here to Return to Menu E
Press GO Here to Return to Cable TV

FIG. 82

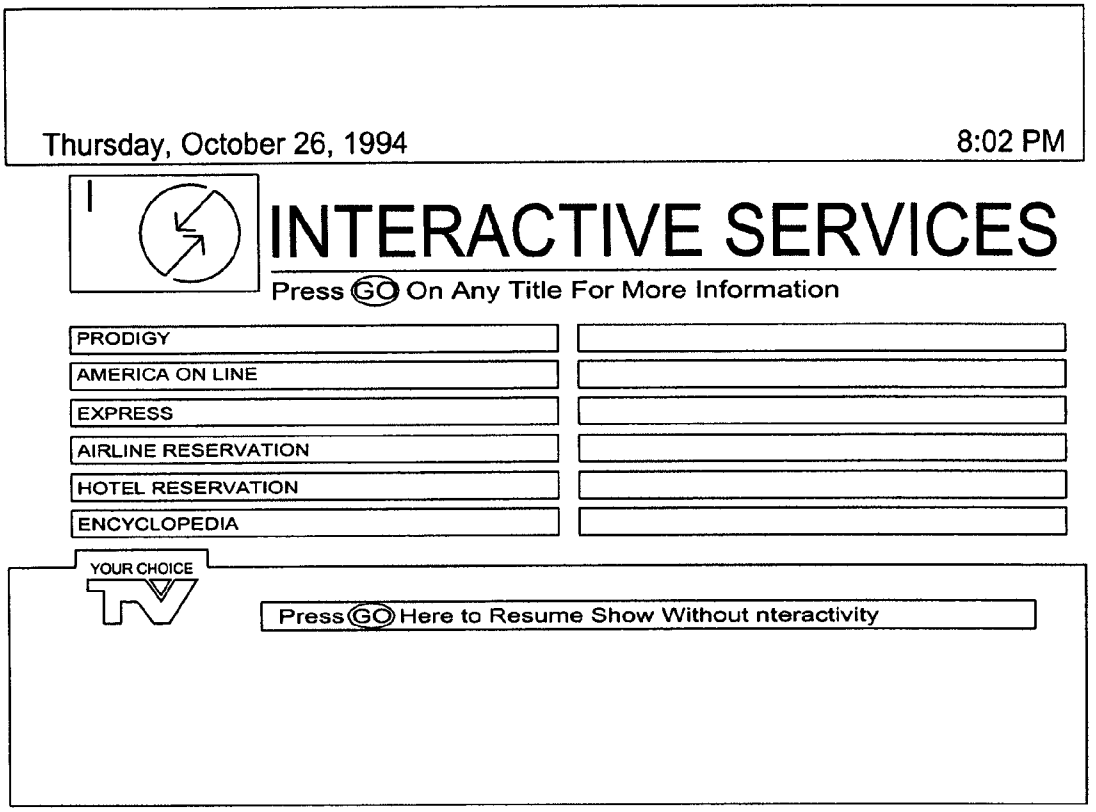

Thursday, October 26, 1994
8:02 PM
INTERACTIVE SERVICES
Press GO On Any Title For More Information
PRODIGY
AMERICA ON LINE
EXPRESS
AIRLINE RESERVATION
HOTEL RESERVATION
ENCYCLOPEDIA
YOUR CHOICE TV
Press GO Here to Resume Show Without nteractivity

FIG. 83

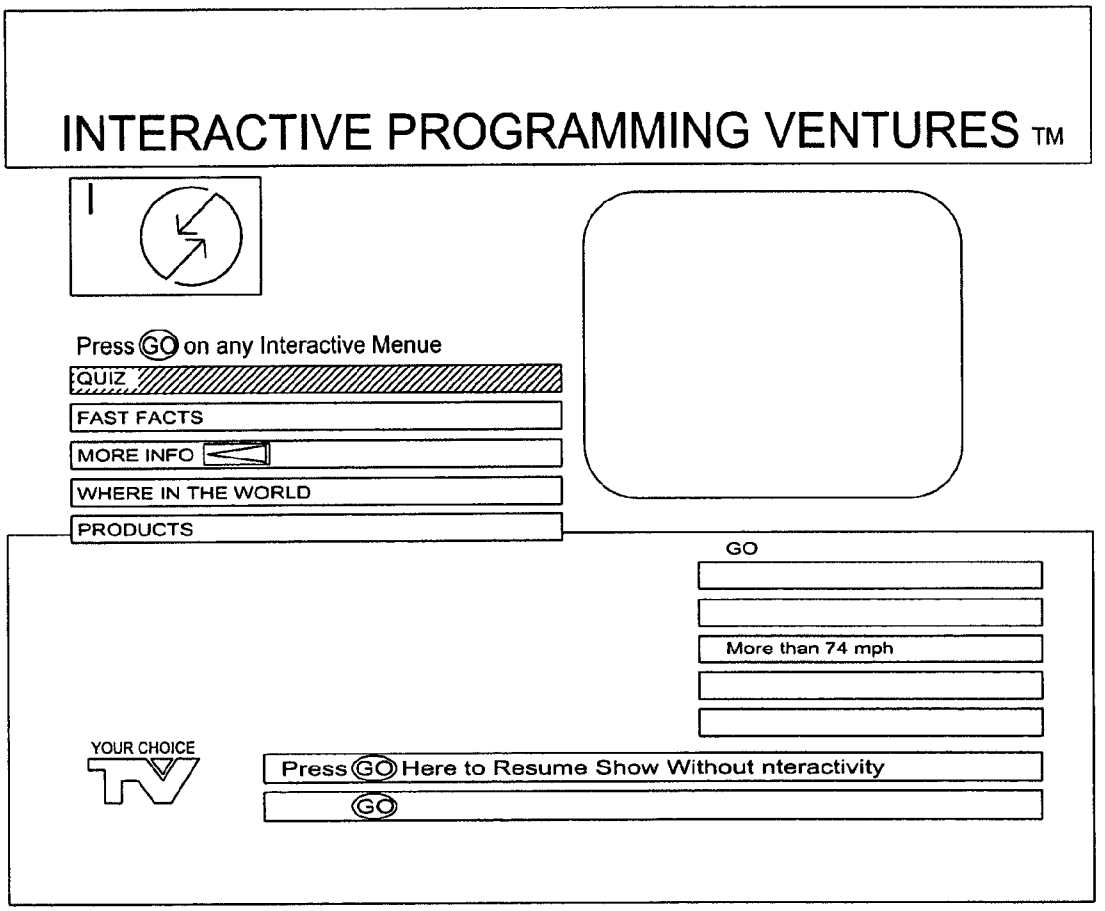

INTERACTIVE PROGRAMMING VENTURES TM
Press GO on any Interactive Menue
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
GO
More than 74 mph
YOUR CHOICE
TV
Press GO Here to Resume Show Without nteractivity
GO

FIG. 84

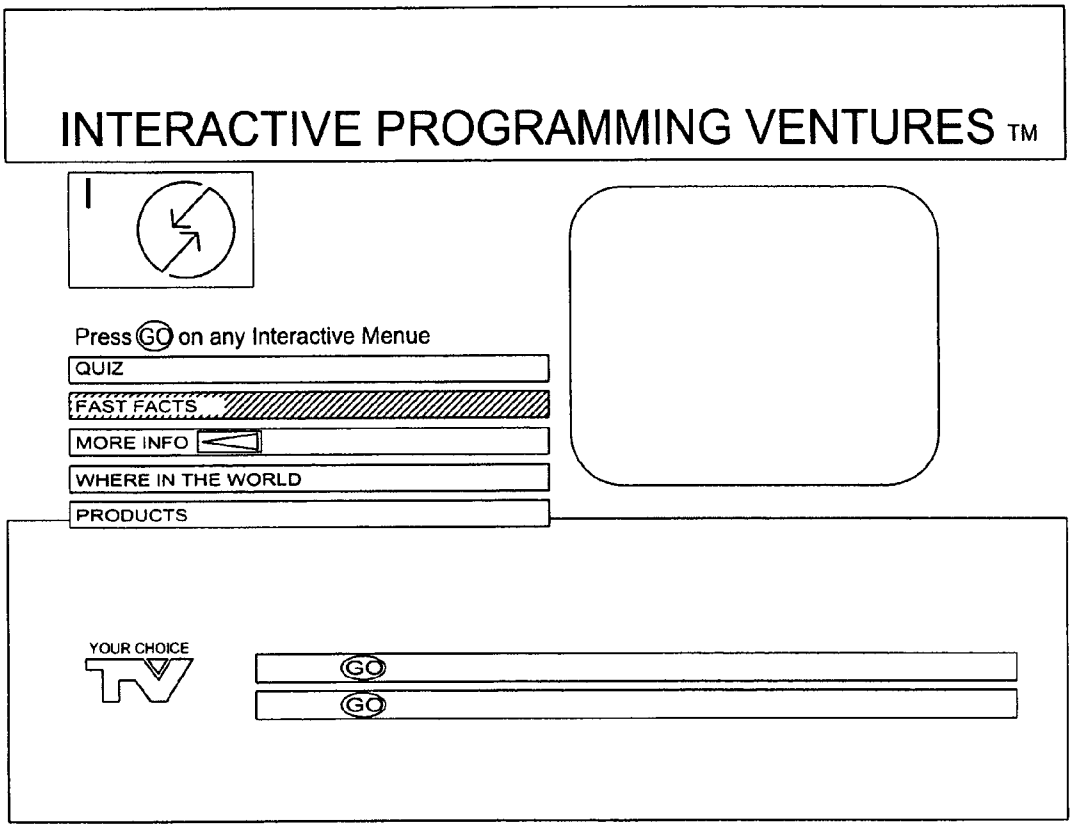

INTERACTIVE PROGRAMMING VENTURES TM
Press GO on any Interactive Menue
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
YOUR CHOICE
TV
GO
GO

FIG. 85

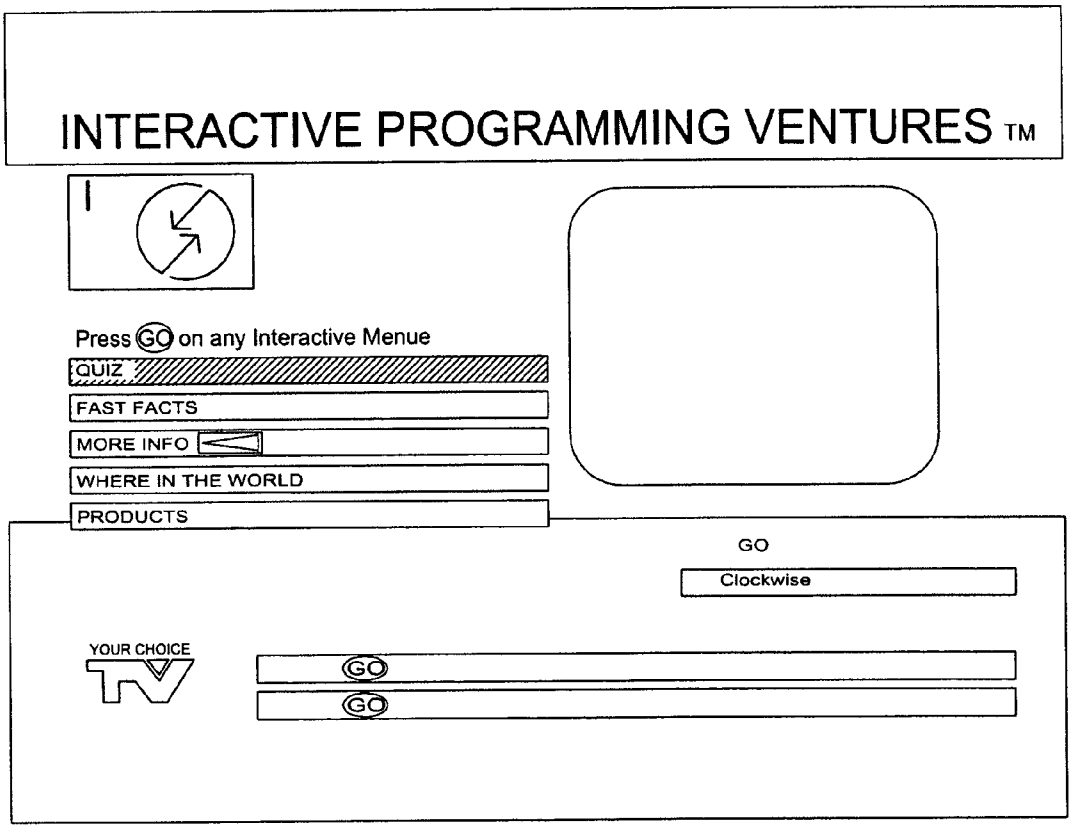

INTERACTIVE PROGRAMMING VENTURES TM
Press GO on any Interactive Menue
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
GO
Clockwise
YOUR CHOICE
TV
GO
GO

FIG. 86

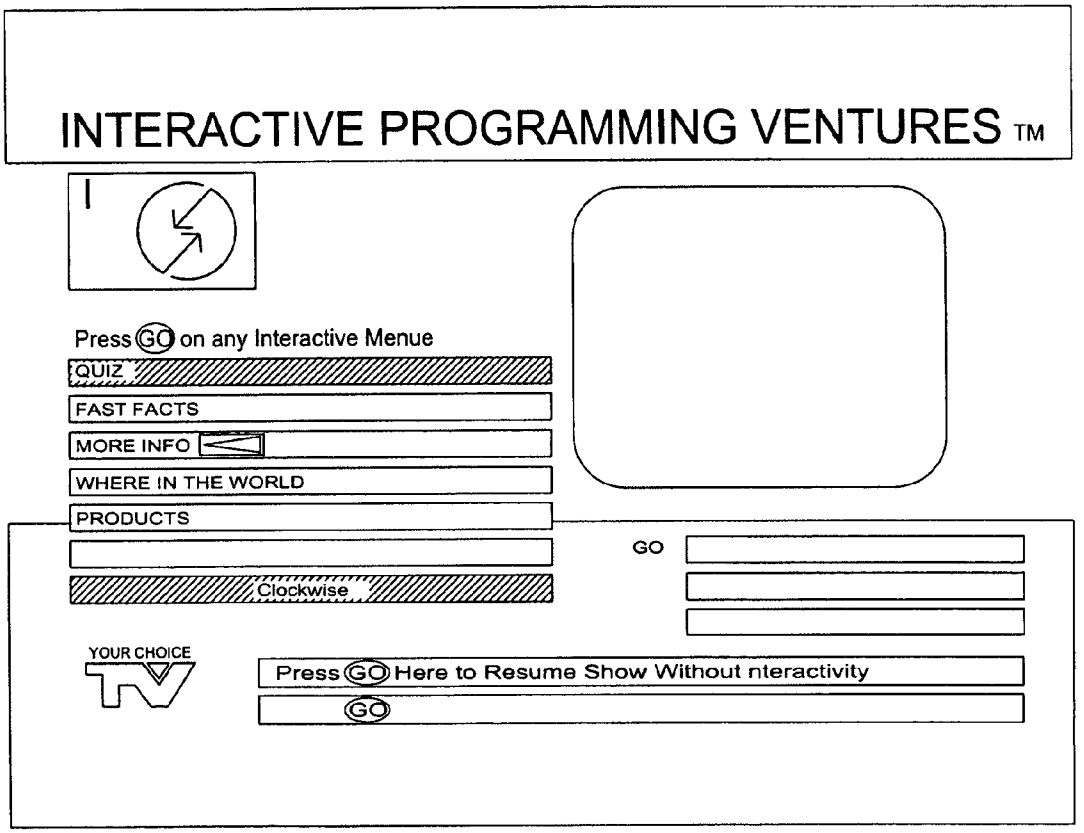

INTERACTIVE PROGRAMMING VENTURES TM
Press GO on any Interactive Menue
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
Clockwise
GO
YOUR CHOICE
TV
Press GO Here to Resume Show Without nteractivity
GO

FIG. 87

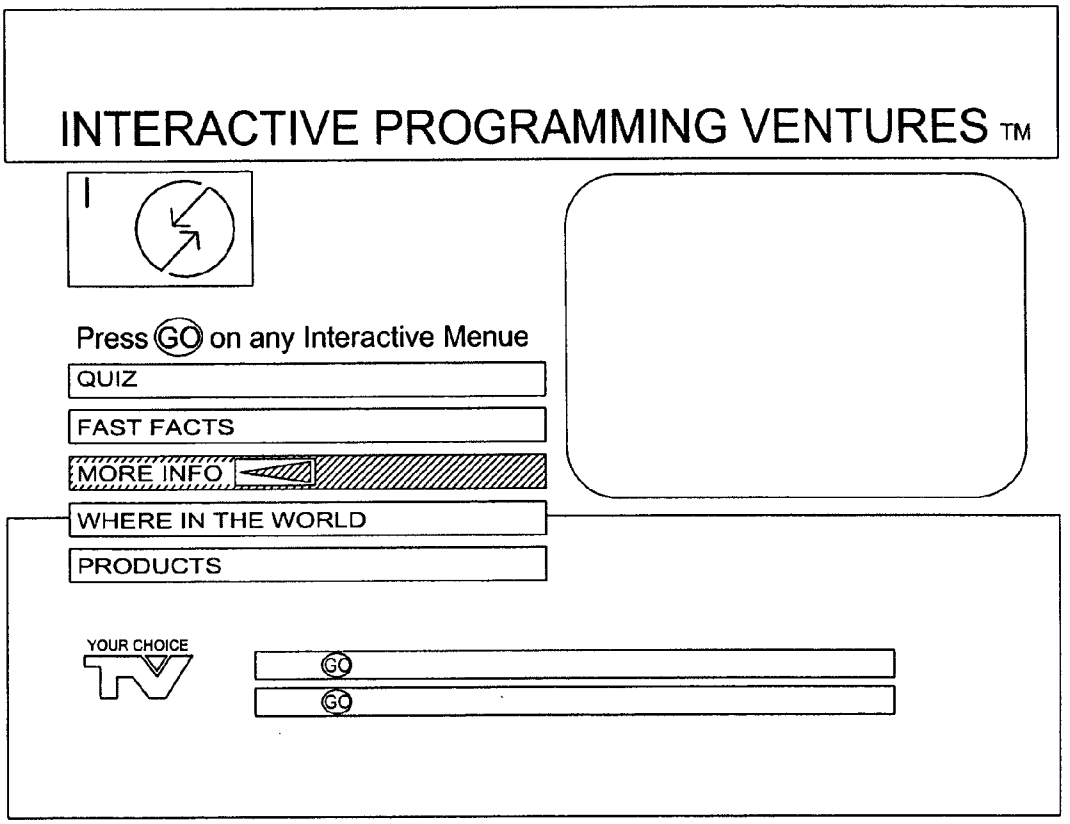

INTERACTIVE PROGRAMMING VENTURES TM
Press GO on any Interactive Menue
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
YOUR CHOICE
GO
GO

FIG. 88

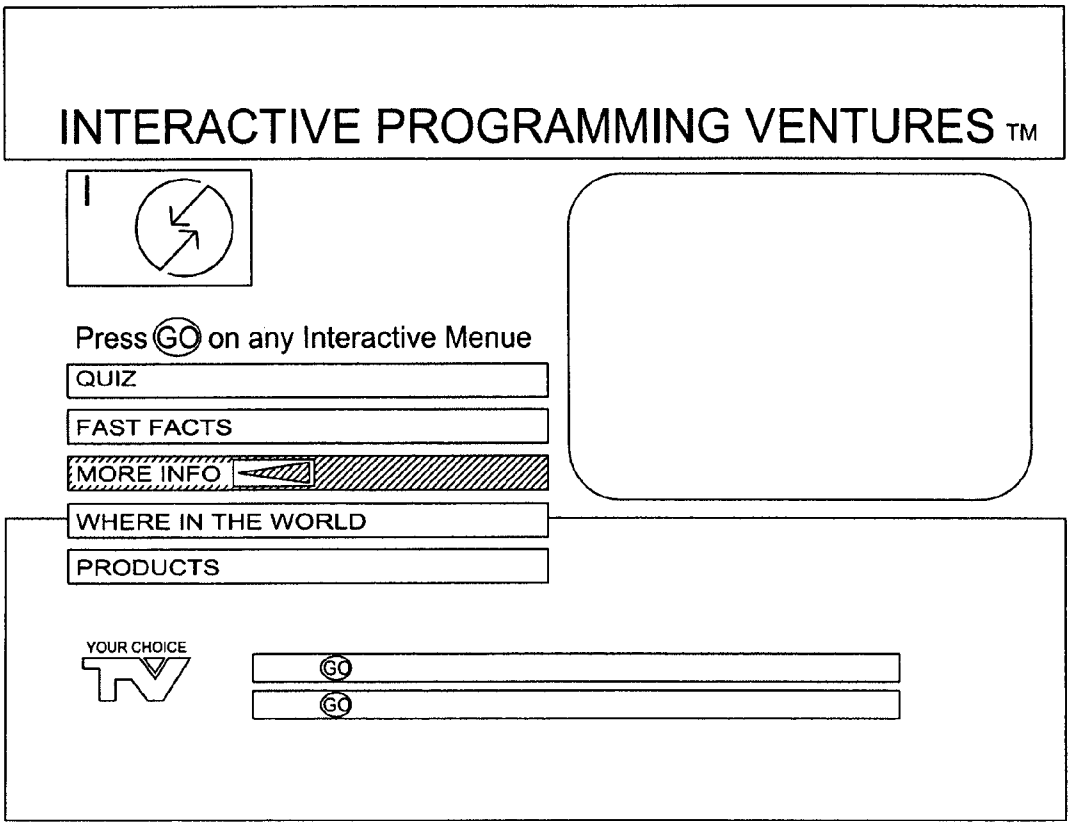

INTERACTIVE PROGRAMMING VENTURES TM
Press GO on any Interactive Menue
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
YOUR CHOICE
TV
GO
GO

FIG. 89

FIG. 90

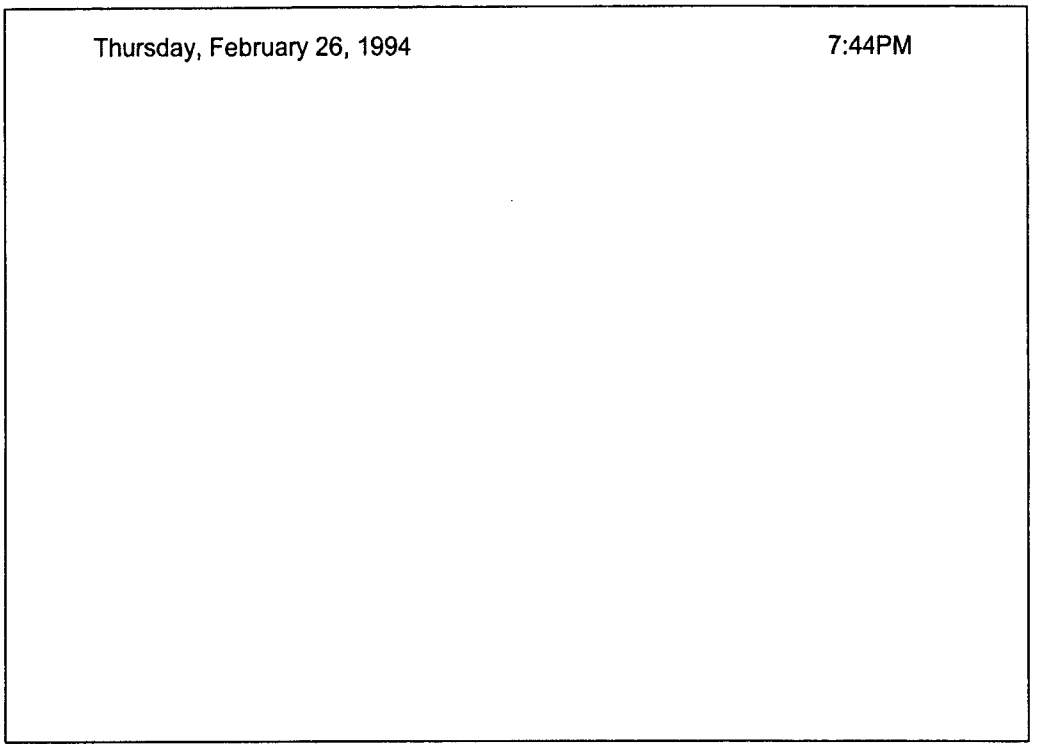


Fig. 91

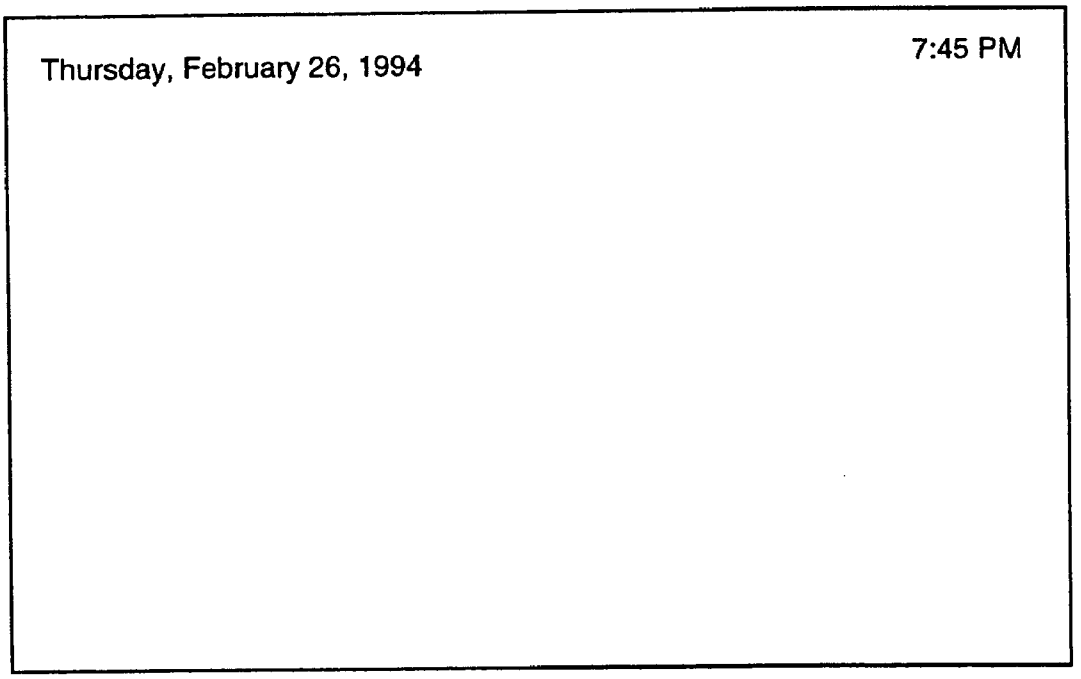


Fig. 92

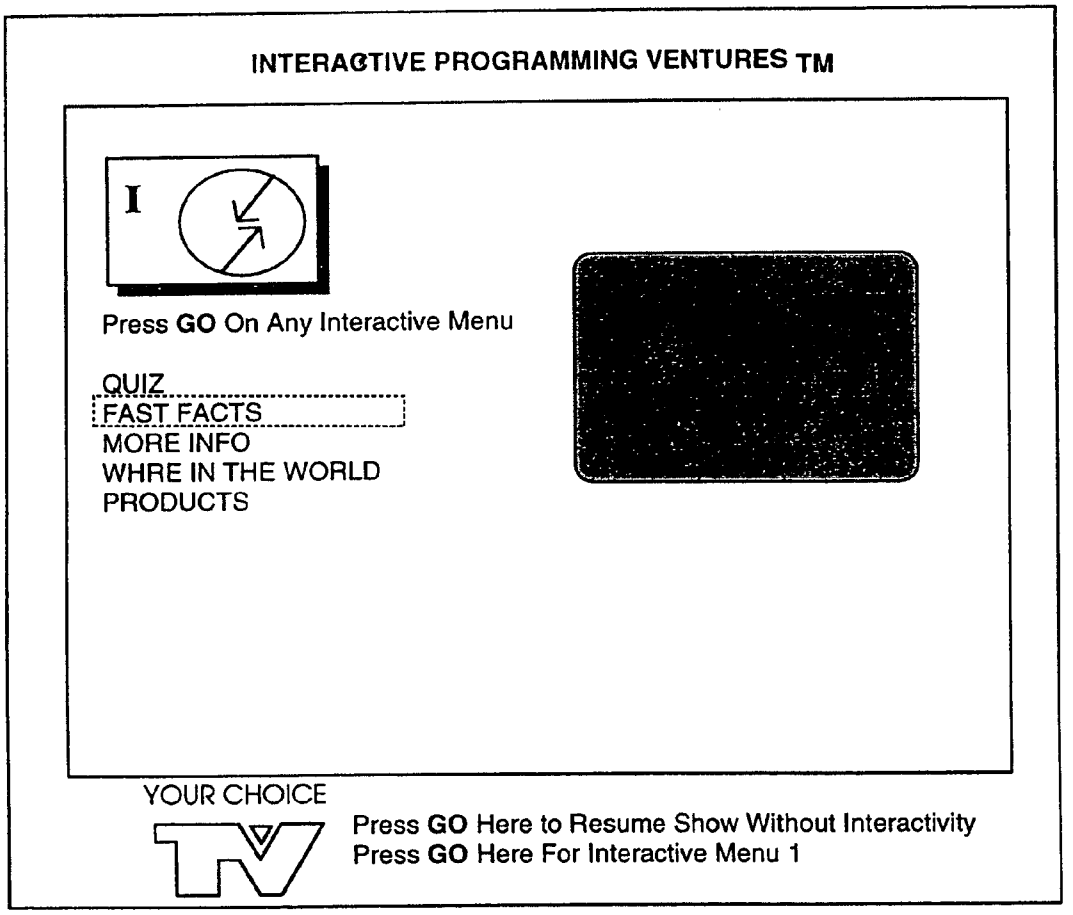

INTERACTIVE PROGRAMMING VENTURES TM
I
Press GO On Any Interactive Menu
QUIZ
FAST FACTS
MORE INFO
WHRE IN THE WORLD
PRODUCTS
YOUR CHOICE
Press GO Here to Resume Show Without Interactivity
Press GO Here For Interactive Menu 1

Fig. 93

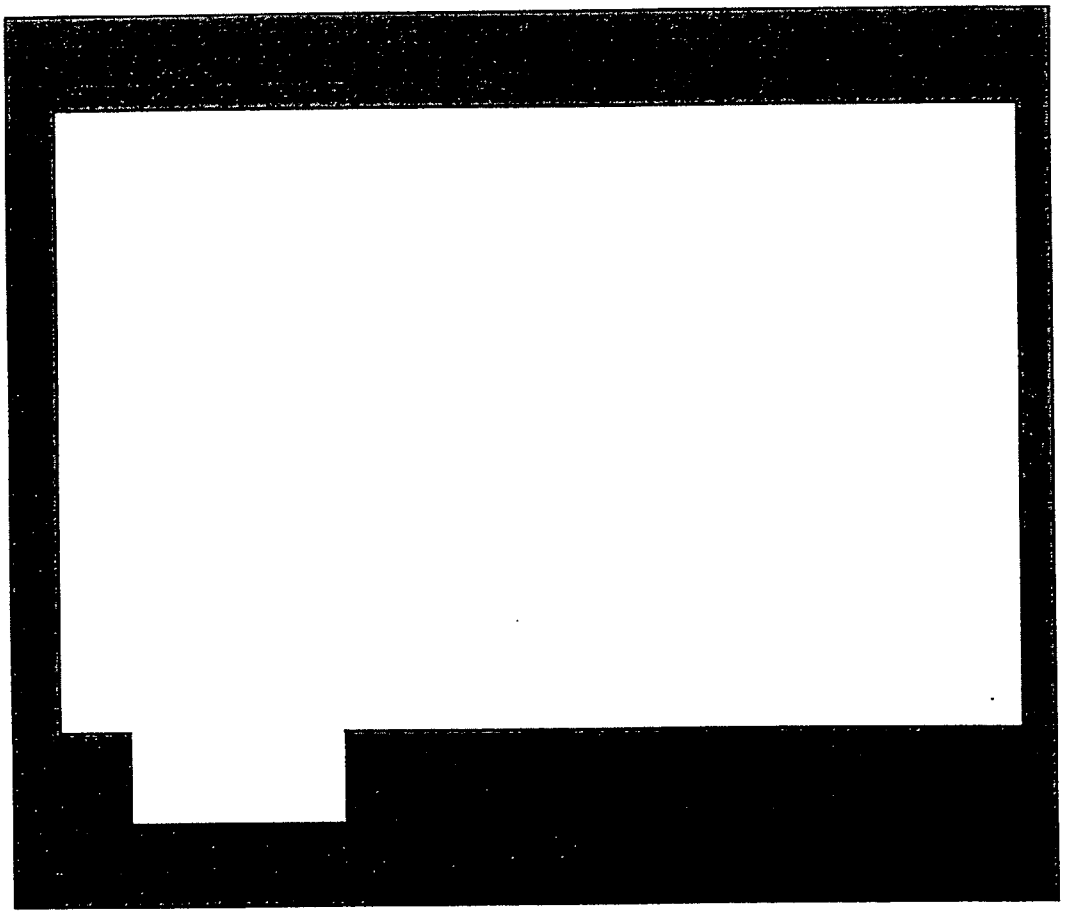


Fig. 94

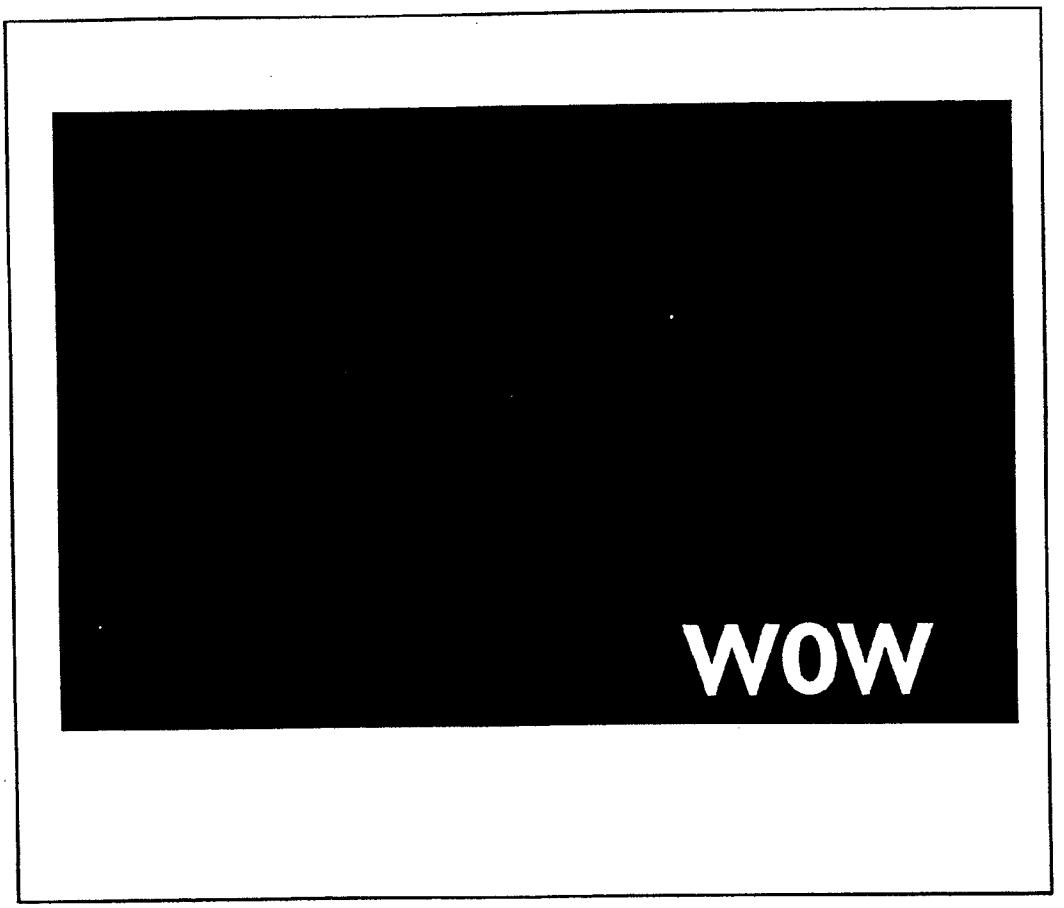


Fig. 95

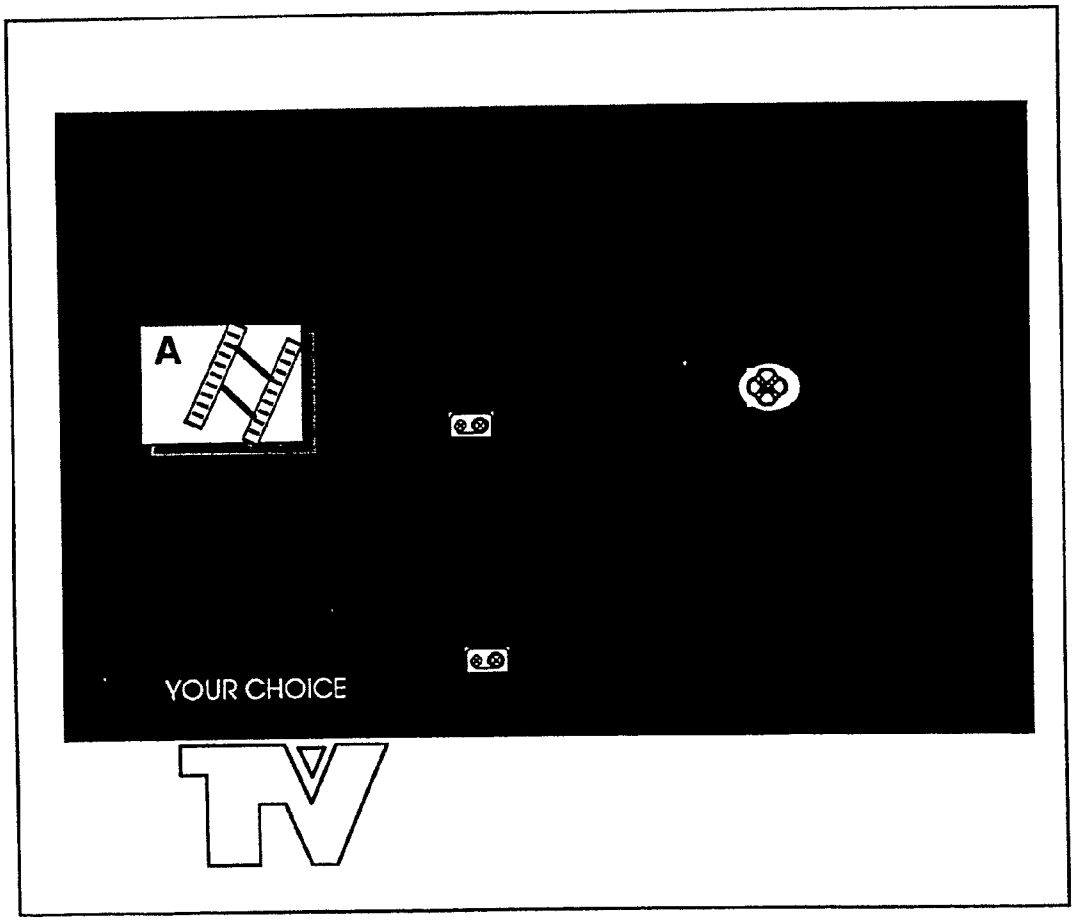


Fig. 96

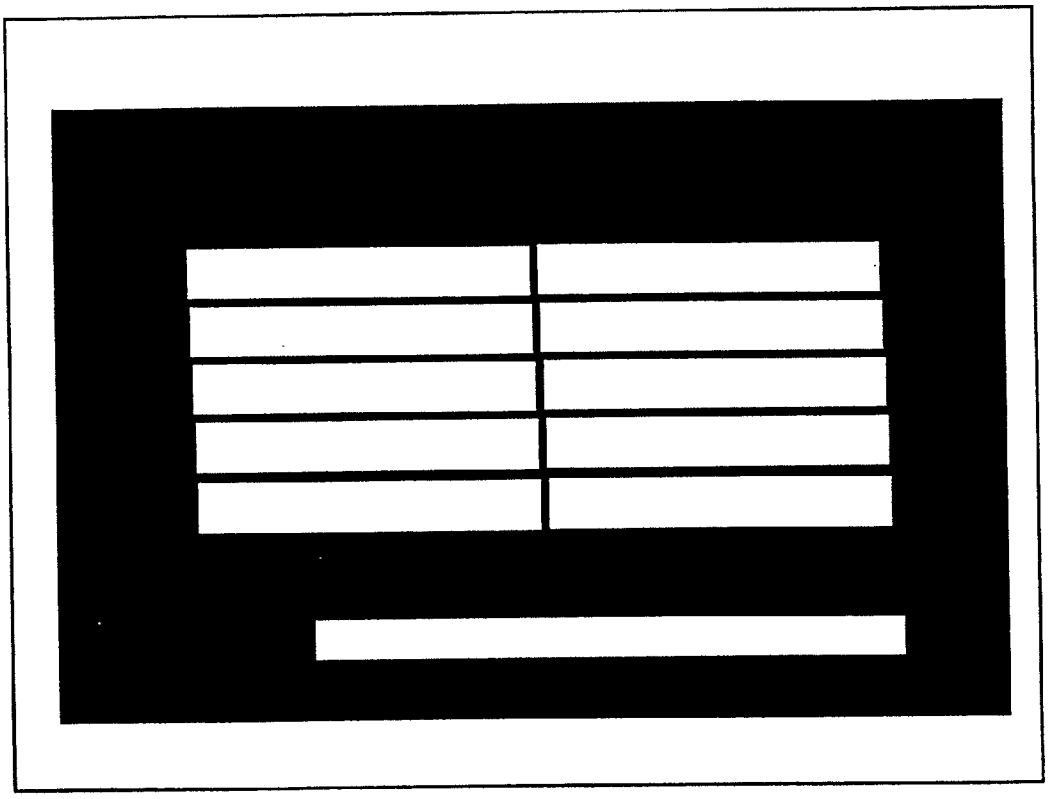


Fig. 97

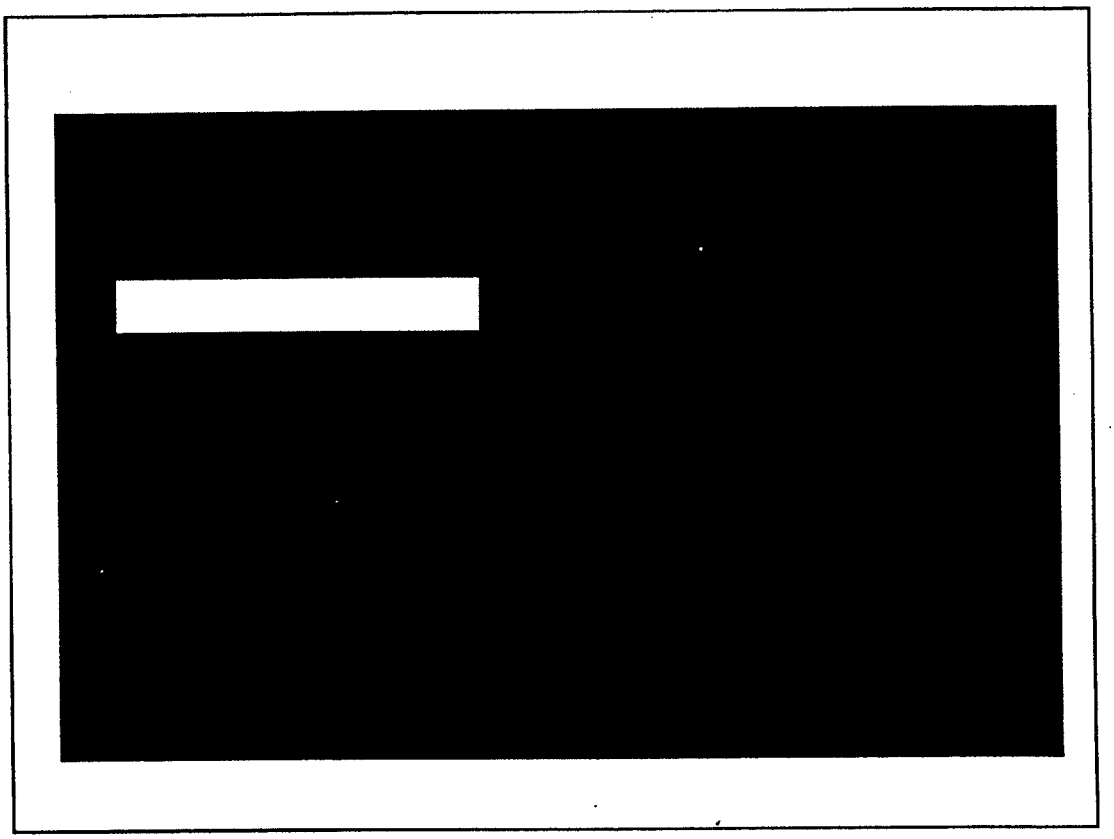
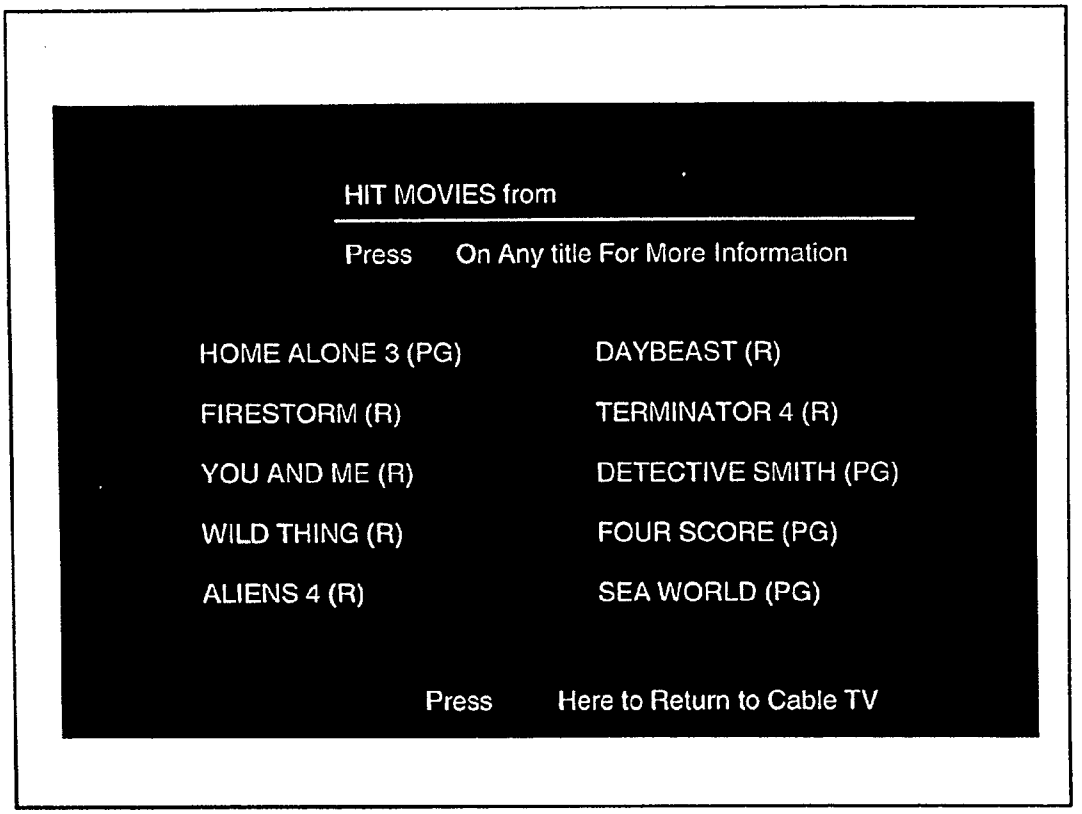


Fig. 98


HIT MOVIES from
Press On Any title For More Information
HOME ALONE 3 (PG)
DAYBEAST (R)
FIRESTORM (R)
TERMINATOR 4 (R)
YOU AND ME (R)
DETECTIVE SMITH (PG)
WILD THING (R)
FOUR SCORE (PG)
ALIENS 4 (R)
SEA WORLD (PG)
Press Here to Return to Cable TV

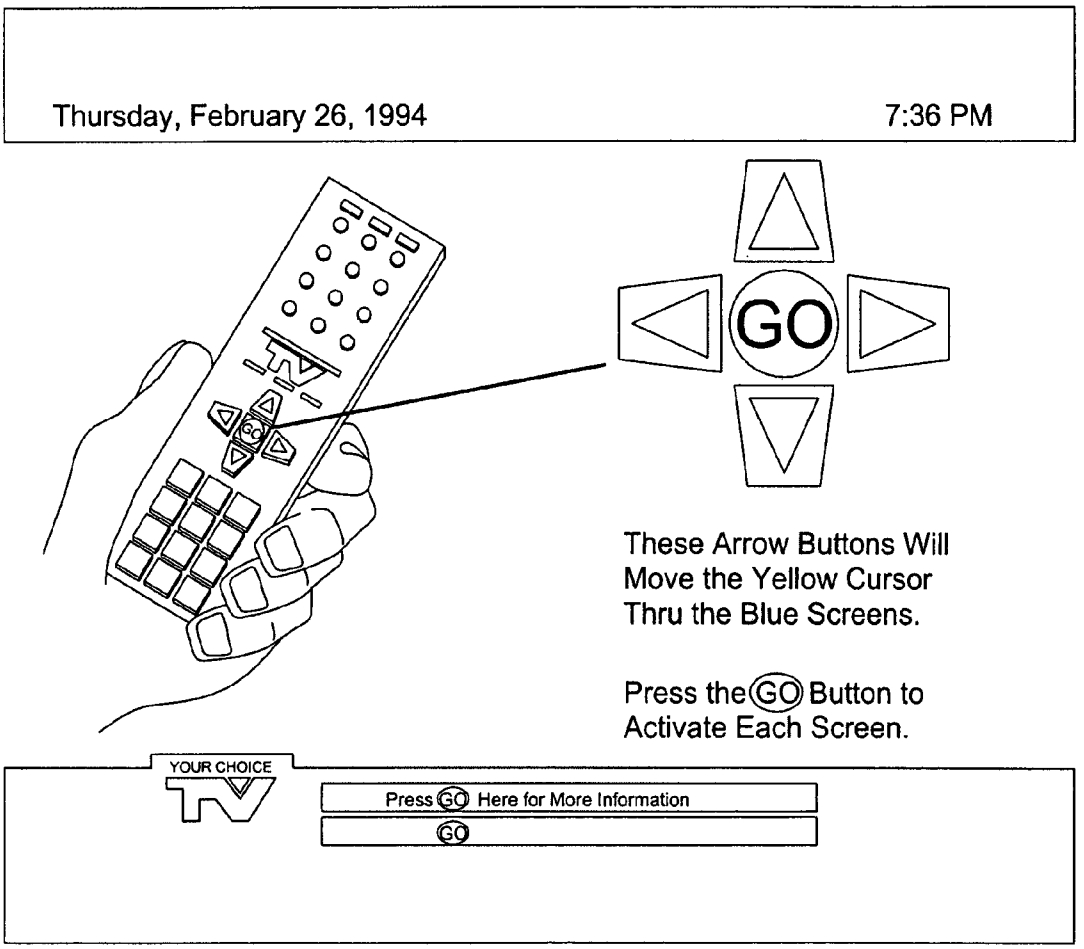

Thursday, February 26, 1994
7:36 PM
GO
These Arrow Buttons Will
Move the Yellow Cursor
Thru the Blue Screens.
Press the GO Button to
Activate Each Screen.
YOUR CHOICE
TV
Press GO Here for More Information
GO

FIG. 99

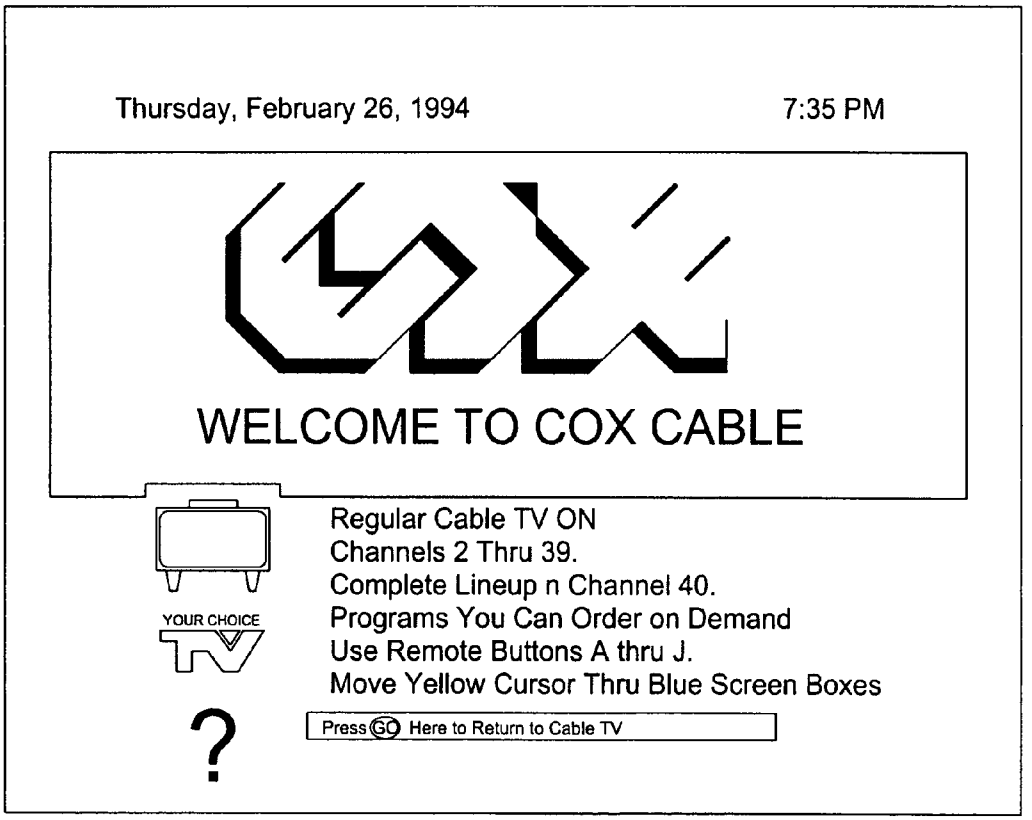

Thursday, February 26, 1994
7:35 PM
WELCOME TO COX CABLE
YOUR CHOICE TV
Regular Cable TV ON
Channels 2 Thru 39.
Complete Lineup n Channel 40.
Programs You Can Order on Demand
Use Remote Buttons A thru J.
Move Yellow Cursor Thru Blue Screen Boxes
?
Press GO Here to Return to Cable TV

FIG. 100

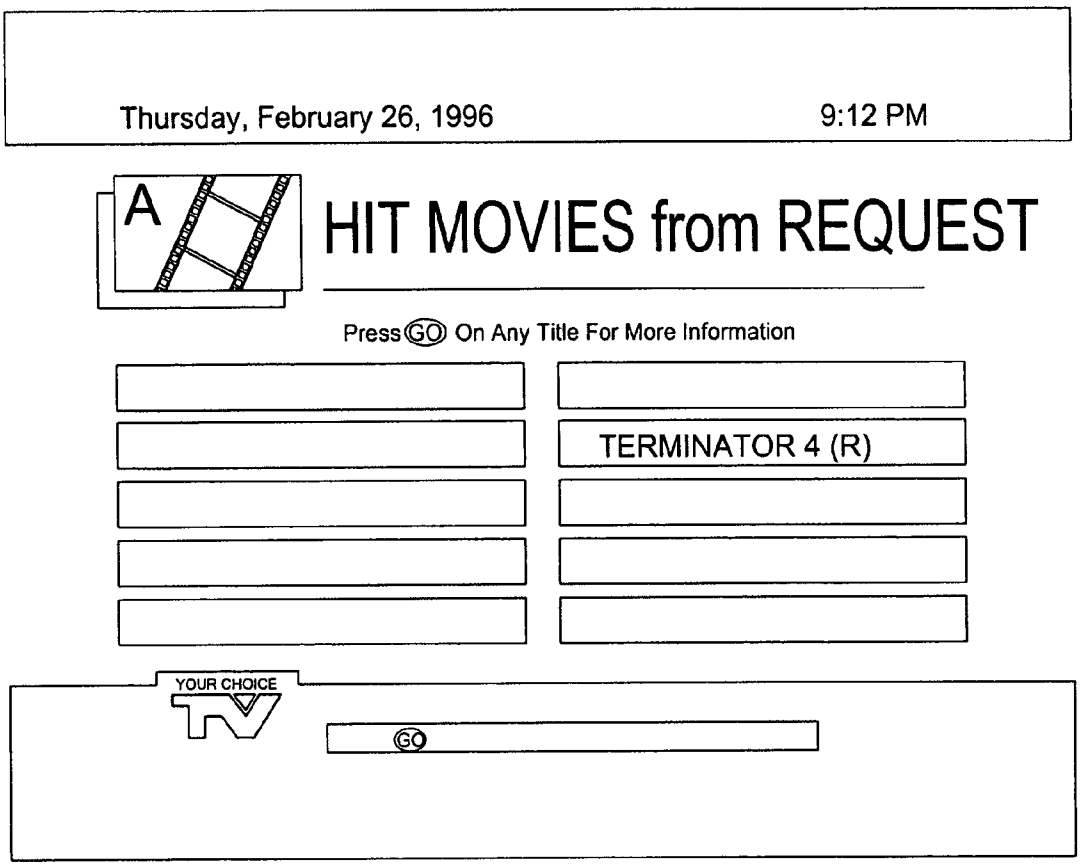

Thursday, February 26, 1996
9:12 PM
A
HIT MOVIES from REQUEST
Press GO On Any Title For More Information
TERMINATOR 4 (R)
YOUR CHOICE TV
GO

FIG. 101

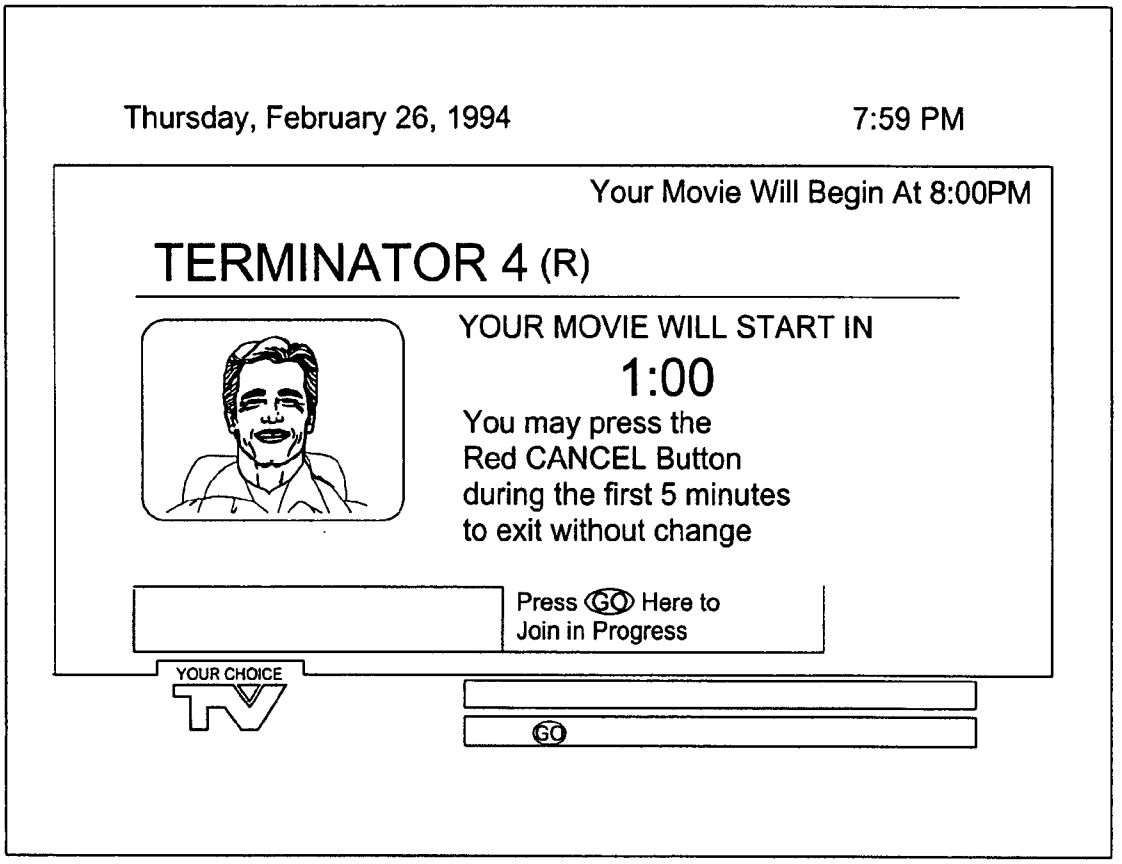

Thursday, February 26, 1994
7:59 PM
Your Movie Will Begin At 8:00PM
TERMINATOR 4 (R)
YOUR MOVIE WILL START IN
1:00
You may press the
Red CANCEL Button
during the first 5 minutes
to exit without change
Press GO Here to
Join in Progress
YOUR CHOICE TV
GO

FIG. 102

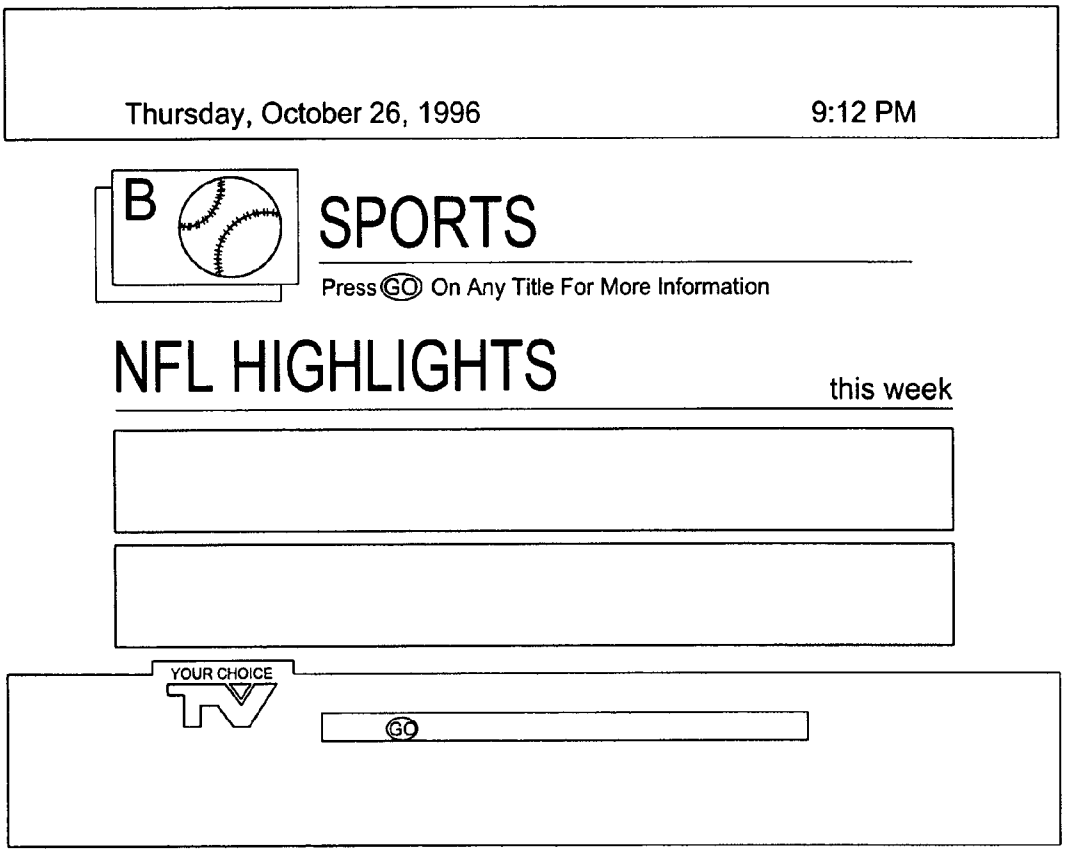

Thursday, October 26, 1996
9:12 PM
B
SPORTS
Press GO On Any Title For More Information
NFL HIGHLIGHTS
this week
YOUR CHOICE TV
GO

FIG. 103

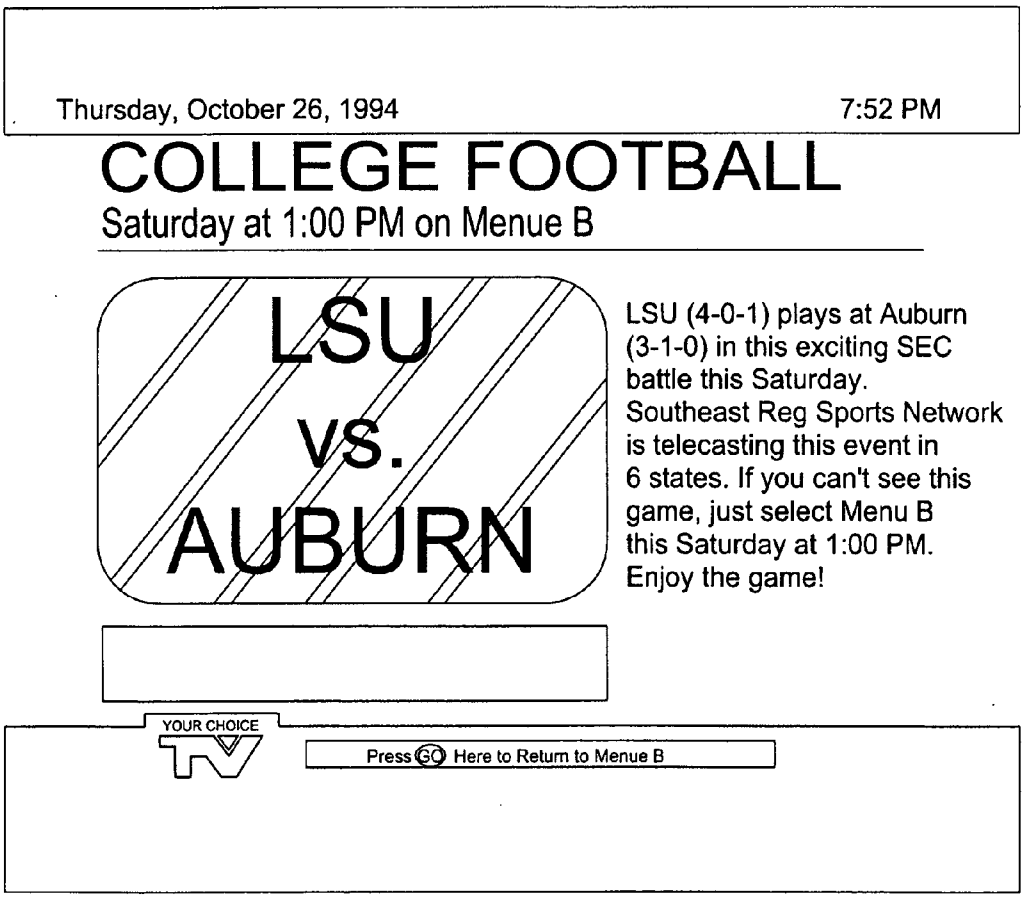

Thursday, October 26, 1994
7:52 PM
COLLEGE FOOTBALL
Saturday at 1:00 PM on Menue B
LSU
vs.
AUBURN
LSU (4-0-1) plays at Auburn (3-1-0) in this exciting SEC battle this Saturday. Southeast Reg Sports Network is telecasting this event in 6 states. If you can't see this game, just select Menu B this Saturday at 1:00 PM. Enjoy the game!
YOUR CHOICE TV
Press GO Here to Return to Menue B

FIG. 104

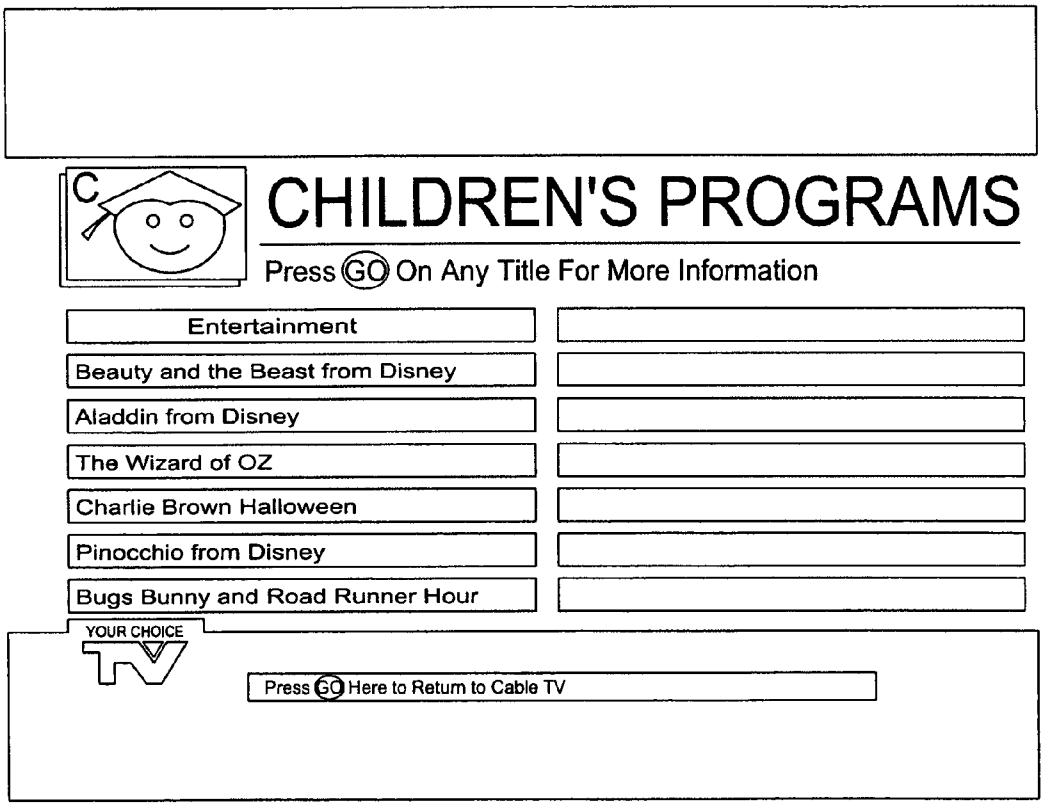

CHILDREN'S PROGRAMS
Press GO On Any Title For More Information
Entertainment
Beauty and the Beast from Disney
Aladdin from Disney
The Wizard of OZ
Charlie Brown Halloween
Pinocchio from Disney
Bugs Bunny and Road Runner Hour
YOUR CHOICE TV
Press GO Here to Return to Cable TV

FIG. 105

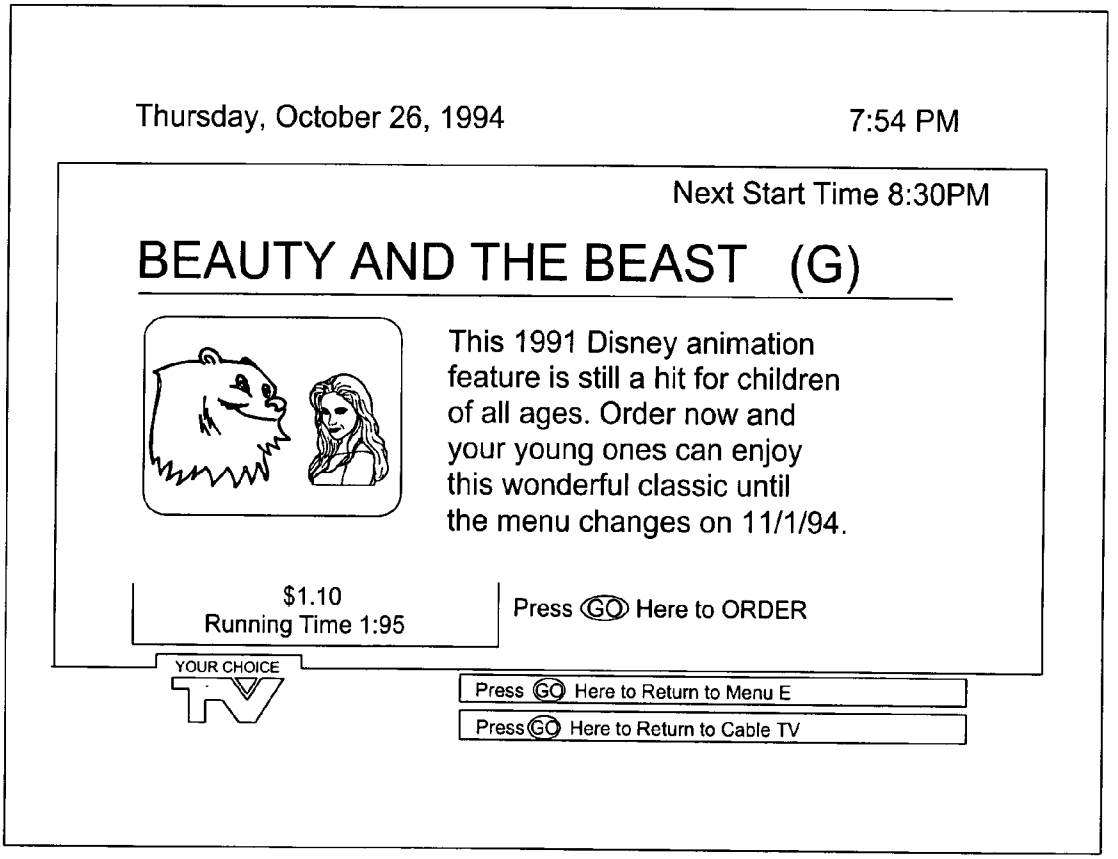

Thursday, October 26, 1994
7:54 PM
Next Start Time 8:30PM
BEAUTY AND THE BEAST (G)
This 1991 Disney animation feature is still a hit for children of all ages. Order now and your young ones can enjoy this wonderful classic until the menu changes on 11/1/94.
$1.10
Running Time 1:95
Press GO Here to ORDER
YOUR CHOICE TV
Press GO Here to Return to Menu E
Press GO Here to Return to Cable TV

FIG. 106

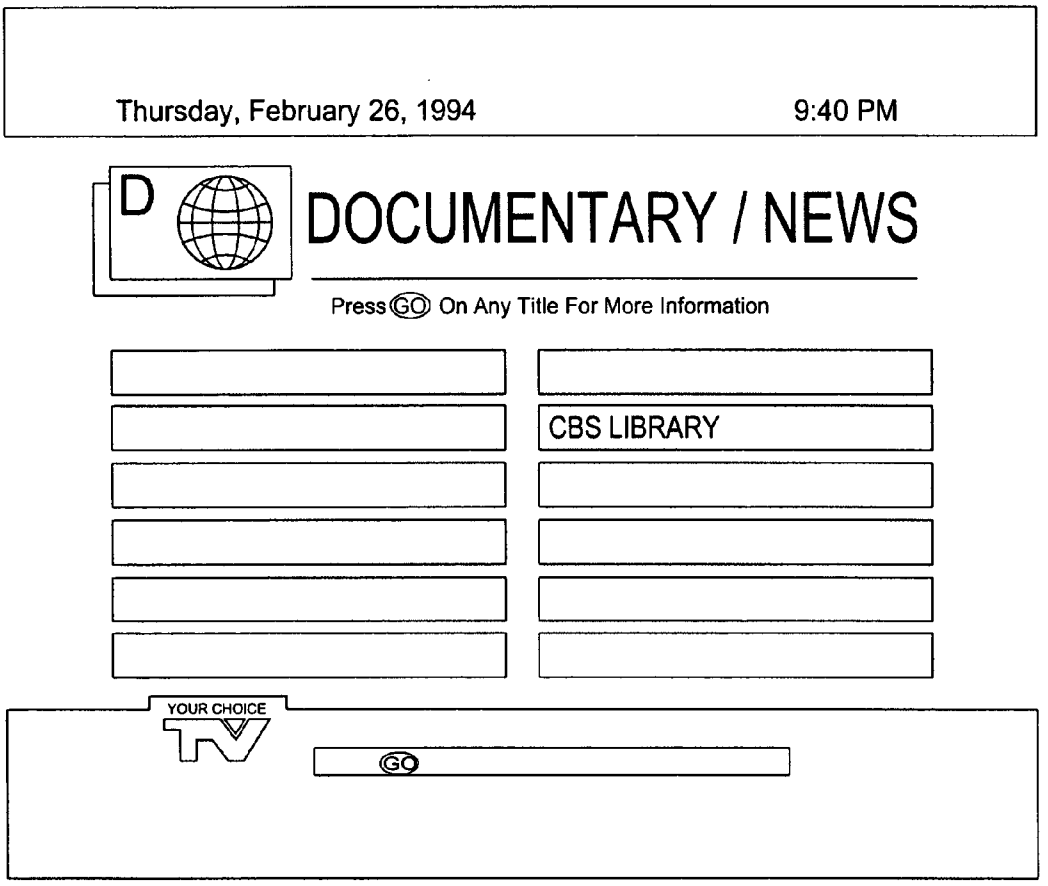

Thursday, February 26, 1994
9:40 PM
D
DOCUMENTARY / NEWS
Press GO On Any Title For More Information
CBS LIBRARY
YOUR CHOICE
TV
GO

FIG. 107

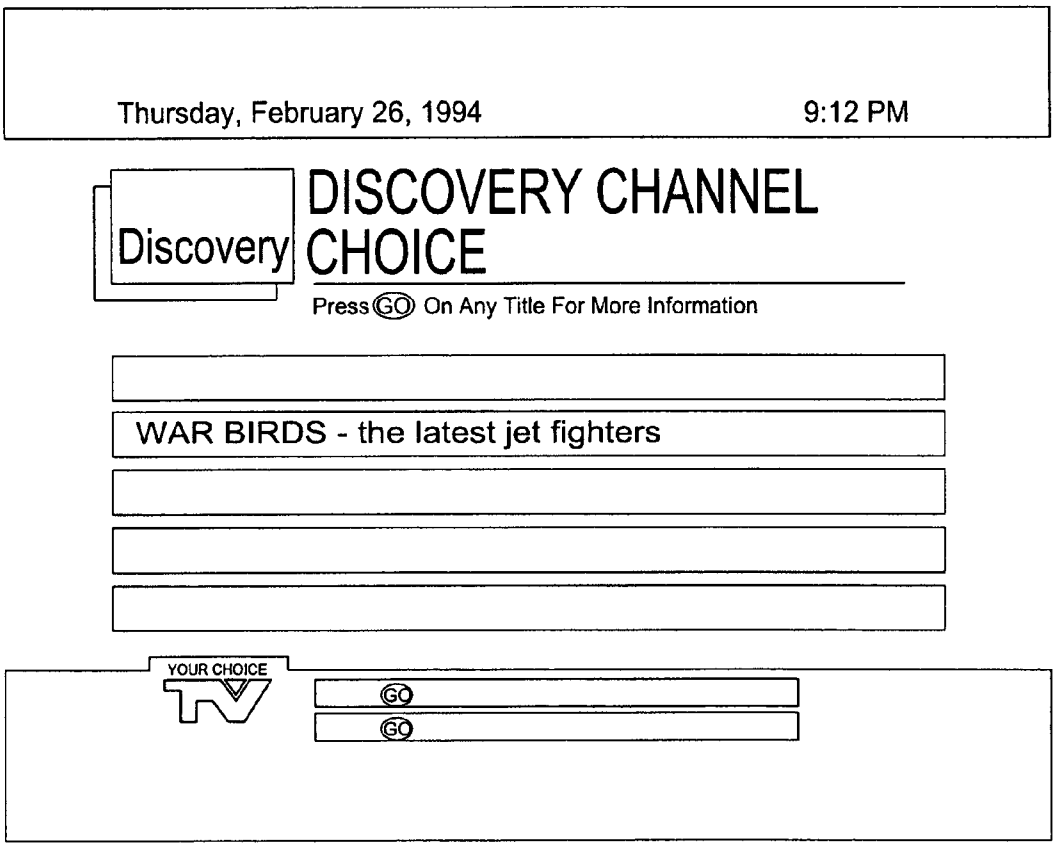

Thursday, February 26, 1994
9:12 PM
Discovery
DISCOVERY CHANNEL
CHOICE
Press GO On Any Title For More Information
WAR BIRDS - the latest jet fighters
YOUR CHOICE
TV
GO
GO

FIG. 108

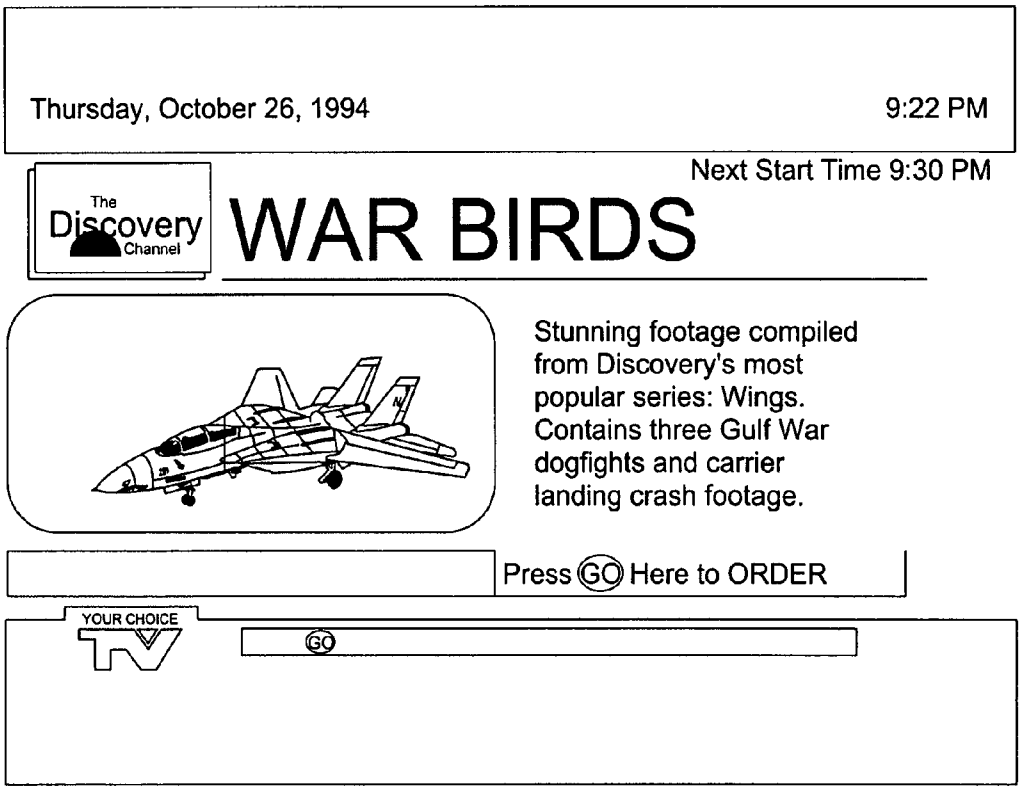

Thursday, October 26, 1994
9:22 PM
Next Start Time 9:30 PM
The Discovery Channel
WAR BIRDS
Stunning footage compiled from Discovery's most popular series: Wings. Contains three Gulf War dogfights and carrier landing crash footage.
Press GO Here to ORDER
YOUR CHOICE TV
GO

FIG. 109

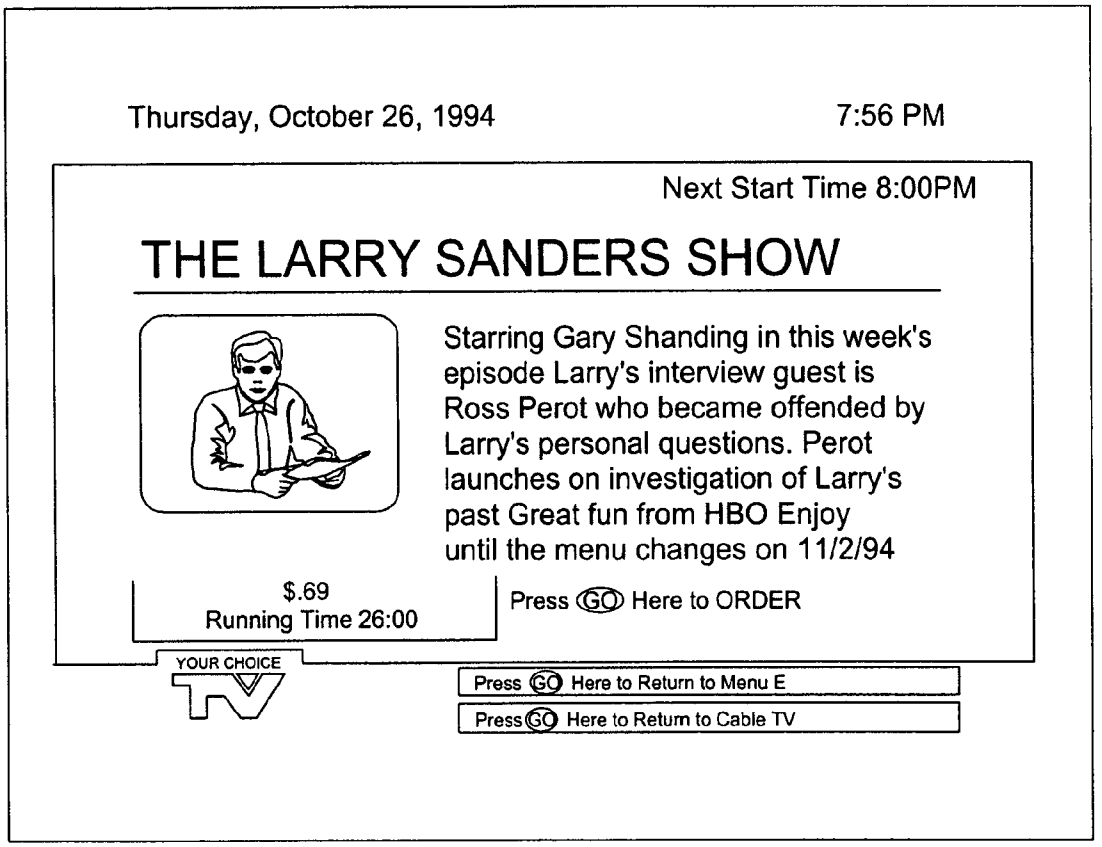

Thursday, October 26, 1994
7:56 PM
Next Start Time 8:00PM
THE LARRY SANDERS SHOW
Starring Gary Shanding in this week's episode Larry's interview guest is Ross Perot who became offended by Larry's personal questions. Perot launches on investigation of Larry's past Great fun from HBO Enjoy until the menu changes on 11/2/94
$.69
Running Time 26:00
Press GO Here to ORDER
YOUR CHOICE TV
Press GO Here to Return to Menu E
Press GO Here to Return to Cable TV

FIG. 110

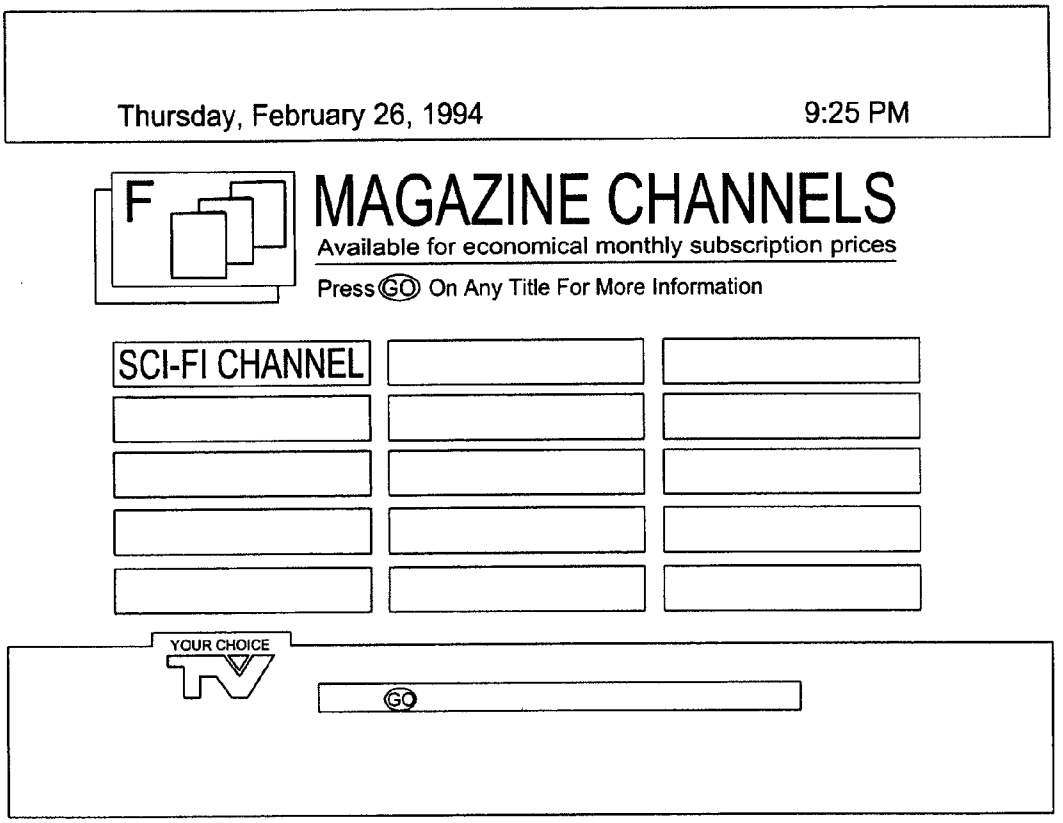

Thursday, February 26, 1994
9:25 PM
F
MAGAZINE CHANNELS
Available for economical monthly subscription prices
Press GO On Any Title For More Information
SCI-FI CHANNEL
YOUR CHOICE
TV
GO

FIG. 111

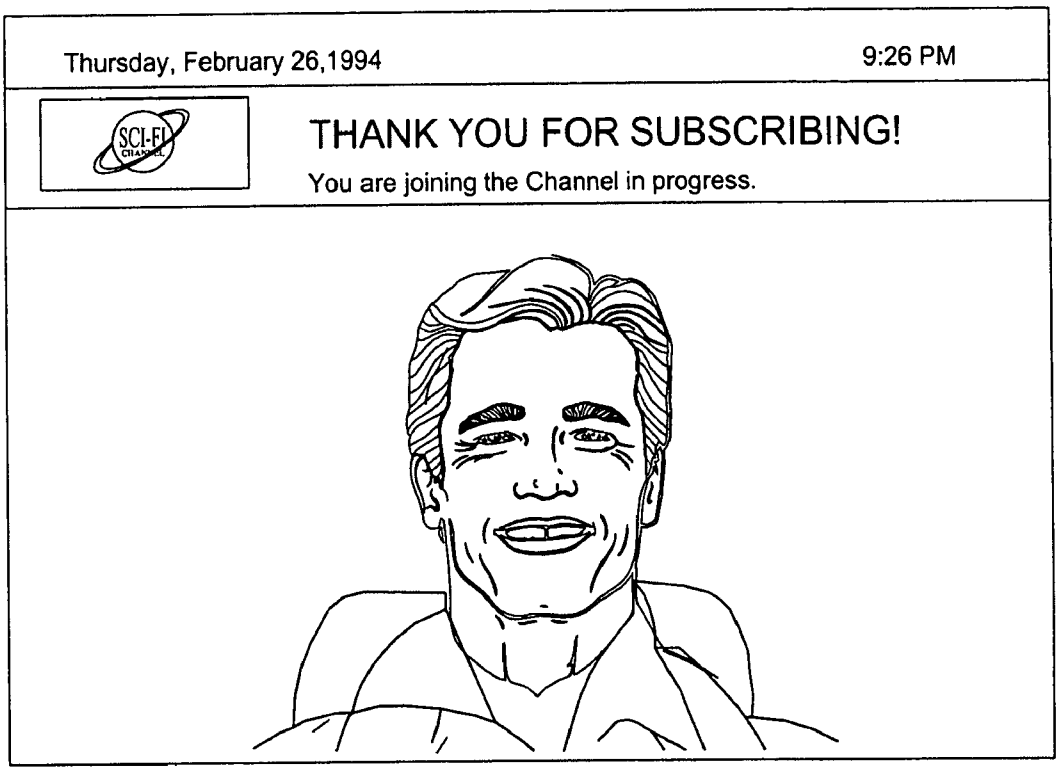

Thursday, February 26,1994
9:26 PM
SCI-FI CHANNEL
THANK YOU FOR SUBSCRIBING!
You are joining the Channel in progress.

FIG. 112

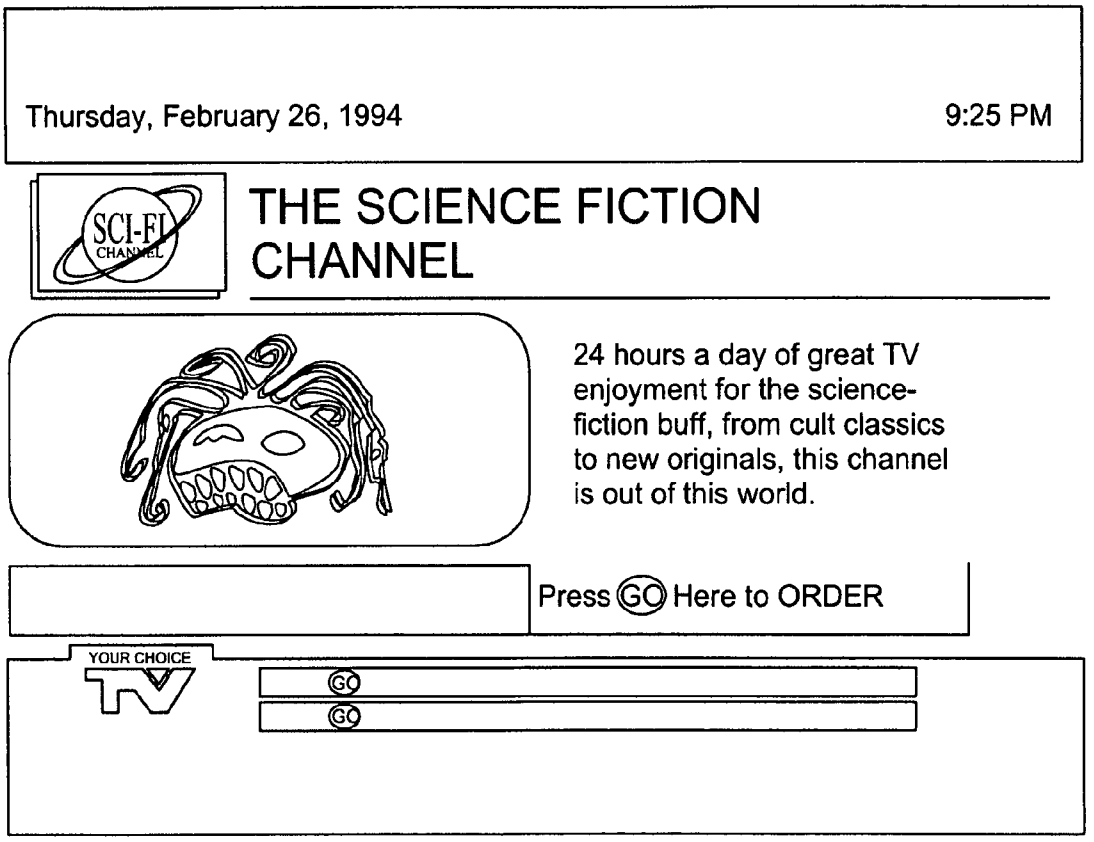

Thursday, February 26, 1994
9:25 PM
SCI-FI CHANNEL
THE SCIENCE FICTION CHANNEL
24 hours a day of great TV enjoyment for the science-fiction buff, from cult classics to new originals, this channel is out of this world.
Press GO Here to ORDER
YOUR CHOICE TV
GO
GO

FIG. 113

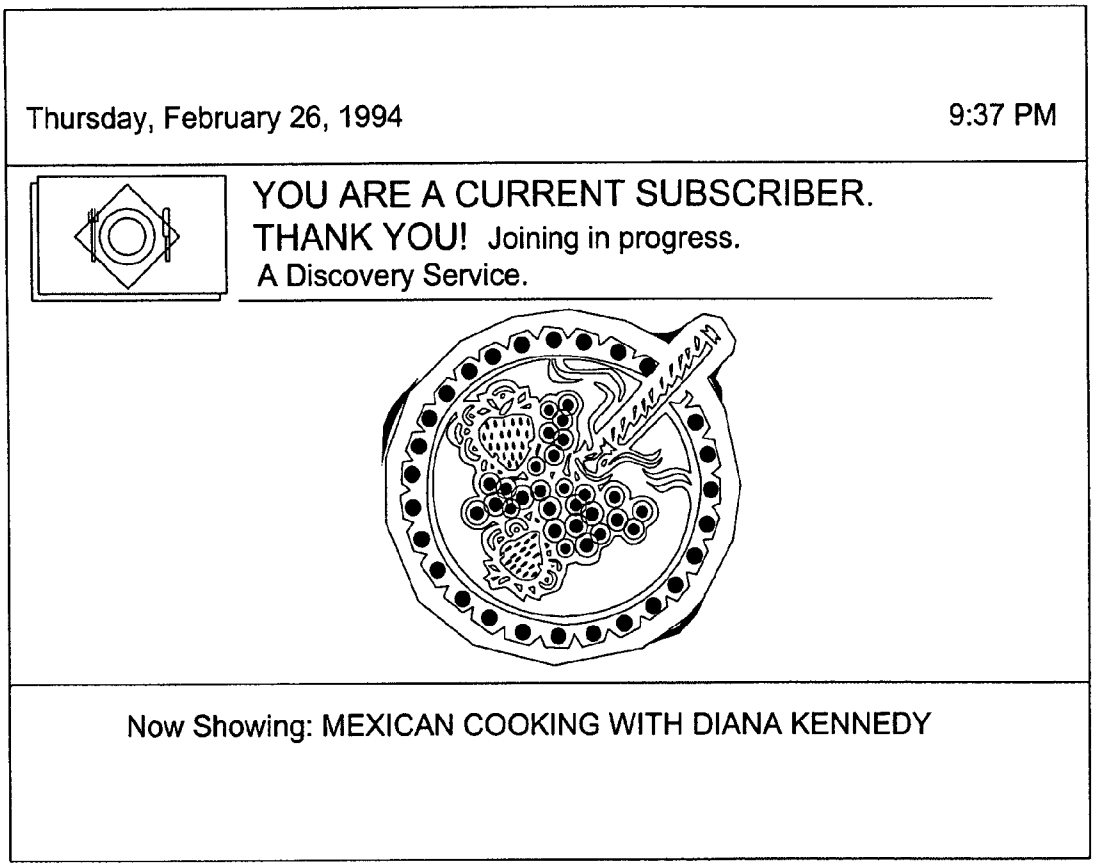

Thursday, February 26, 1994
9:37 PM
YOU ARE A CURRENT SUBSCRIBER.
THANK YOU! Joining in progress.
A Discovery Service.
Now Showing: MEXICAN COOKING WITH DIANA KENNEDY

FIG. 114

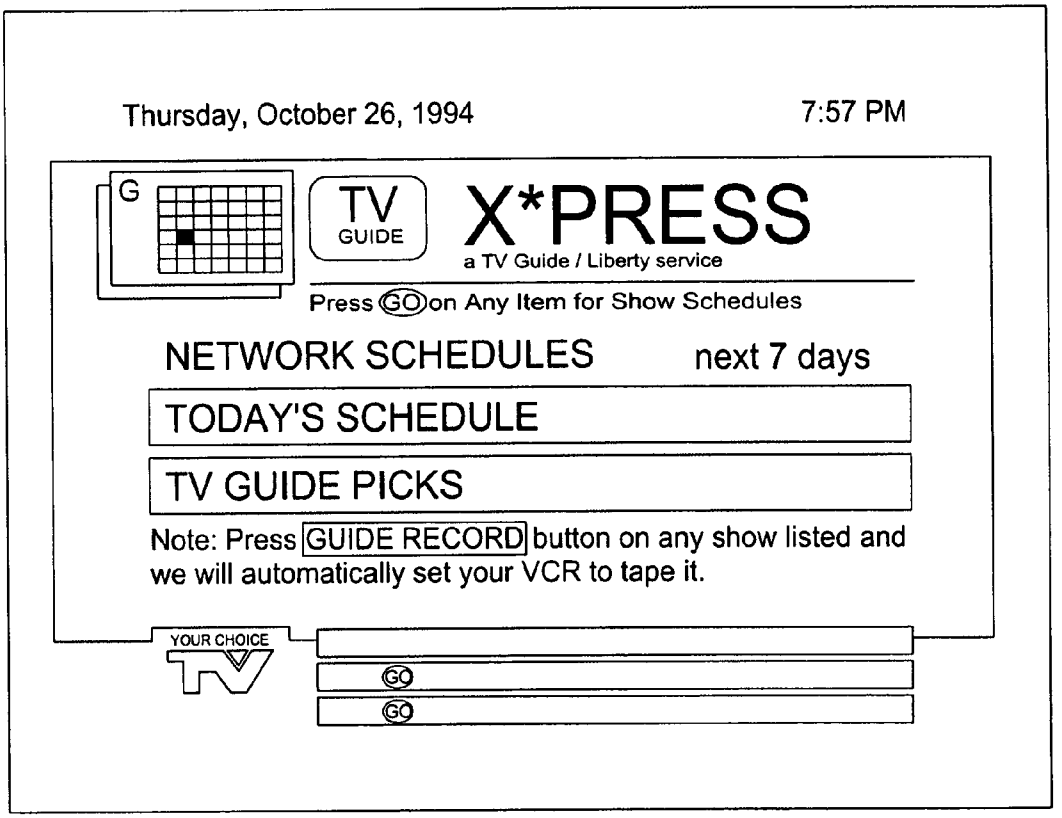

Thursday, October 26, 1994
7:57 PM
G
TV GUIDE
X*PRESS
a TV Guide / Liberty service
Press GO on Any Item for Show Schedules
NETWORK SCHEDULES
next 7 days
TODAY'S SCHEDULE
TV GUIDE PICKS
Note: Press GUIDE RECORD button on any show listed and we will automatically set your VCR to tape it.
YOUR CHOICE TV
GO
GO

FIG. 115

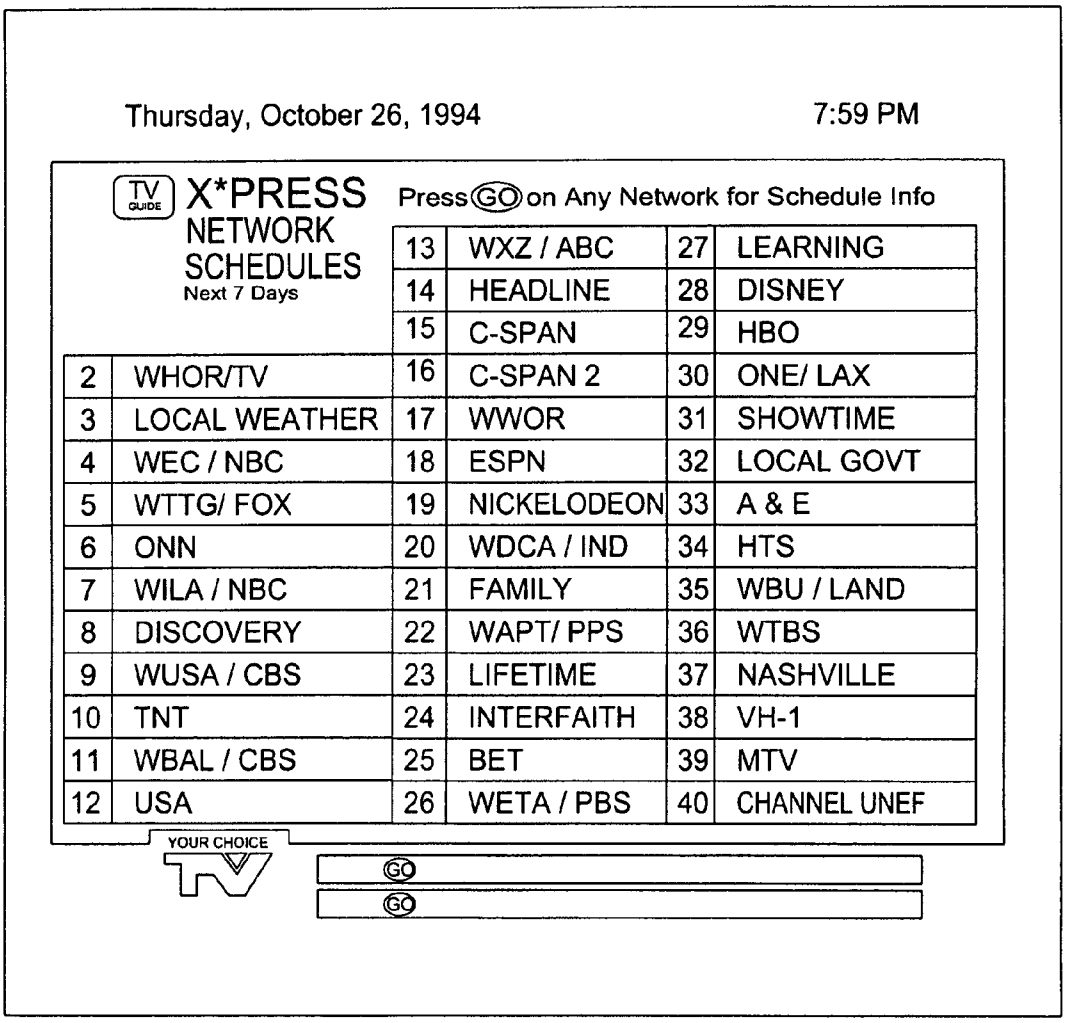

Thursday, October 26, 1994
7:59 PM
TV GUIDE
X*PRESS
NETWORK
SCHEDULES
Next 7 Days
Press GO on Any Network for Schedule Info
2 WHOR/TV
3 LOCAL WEATHER
4 WEC / NBC
5 WTTG/ FOX
6 ONN
7 WILA / NBC
8 DISCOVERY
9 WUSA / CBS
10 TNT
11 WBAL / CBS
12 USA
13 WXZ / ABC
14 HEADLINE
15 C-SPAN
16 C-SPAN 2
17 WWOR
18 ESPN
19 NICKELODEON
20 WDCA / IND
21 FAMILY
22 WAPT/ PPS
23 LIFETIME
24 INTERFAITH
25 BET
26 WETA / PBS
27 LEARNING
28 DISNEY
29 HBO
30 ONE/ LAX
31 SHOWTIME
32 LOCAL GOVT
33 A & E
34 HTS
35 WBU / LAND
36 WTBS
37 NASHVILLE
38 VH-1
39 MTV
40 CHANNEL UNEF
YOUR CHOICE TV
GO
GO

FIG. 116

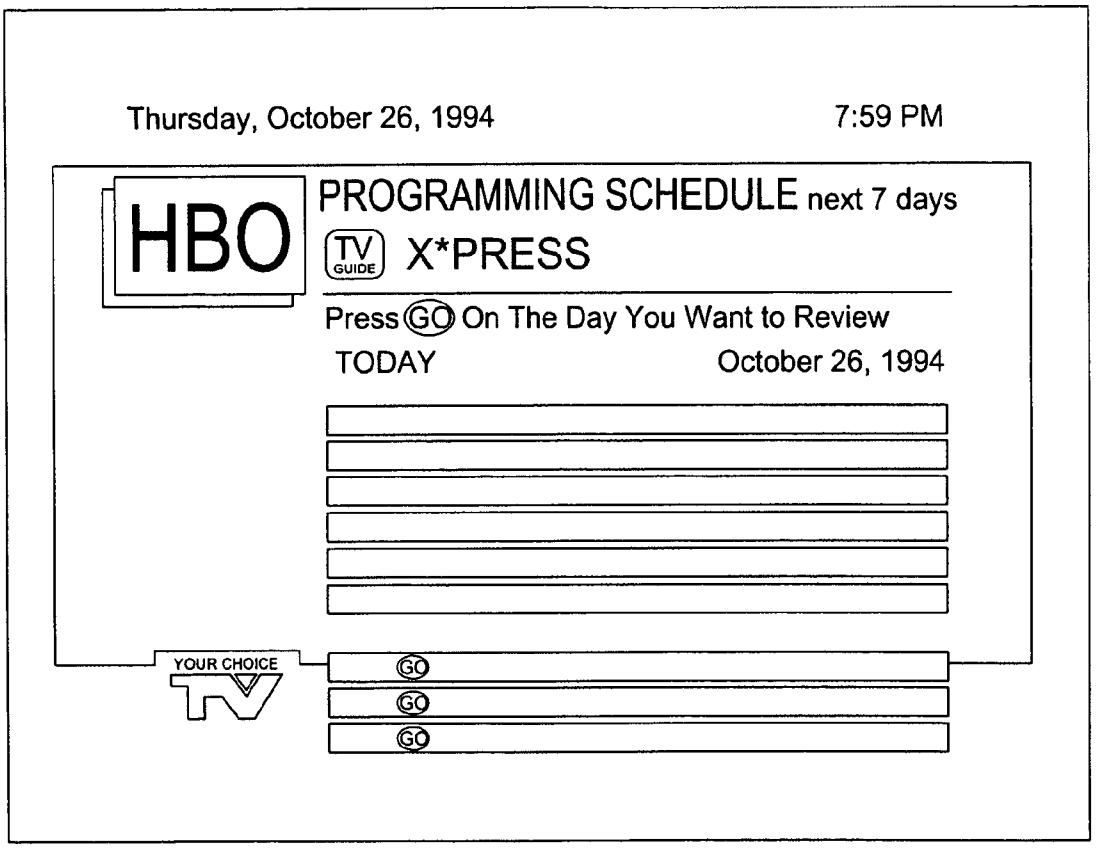

Thursday, October 26, 1994
7:59 PM
HBO
PROGRAMMING SCHEDULE next 7 days
TV GUIDE X*PRESS
Press GO On The Day You Want to Review
TODAY
October 26, 1994
YOUR CHOICE TV
GO
GO
GO

FIG. 117

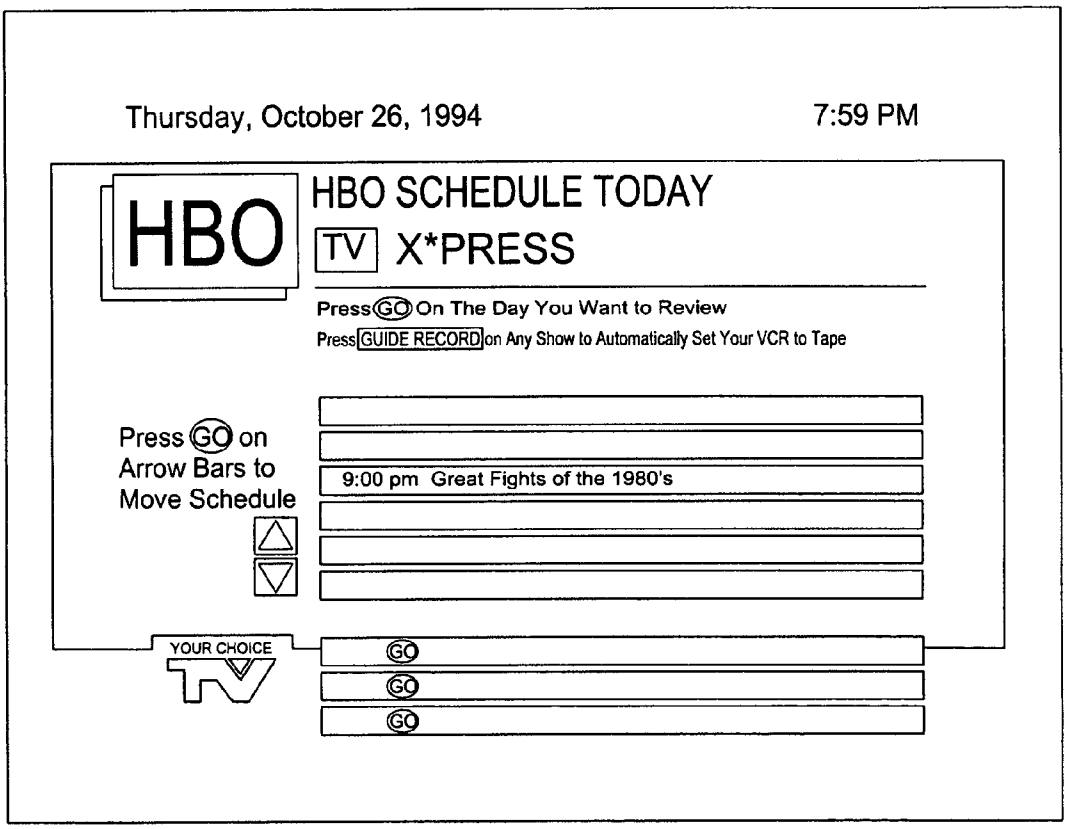

Thursday, October 26, 1994
7:59 PM
HBO
HBO SCHEDULE TODAY
TV X*PRESS
Press GO On The Day You Want to Review
Press GUIDE RECORD on Any Show to Automatically Set Your VCR to Tape
Press GO on Arrow Bars to Move Schedule
9:00 pm Great Fights of the 1980's
YOUR CHOICE TV
GO
GO
GO

FIG. 118

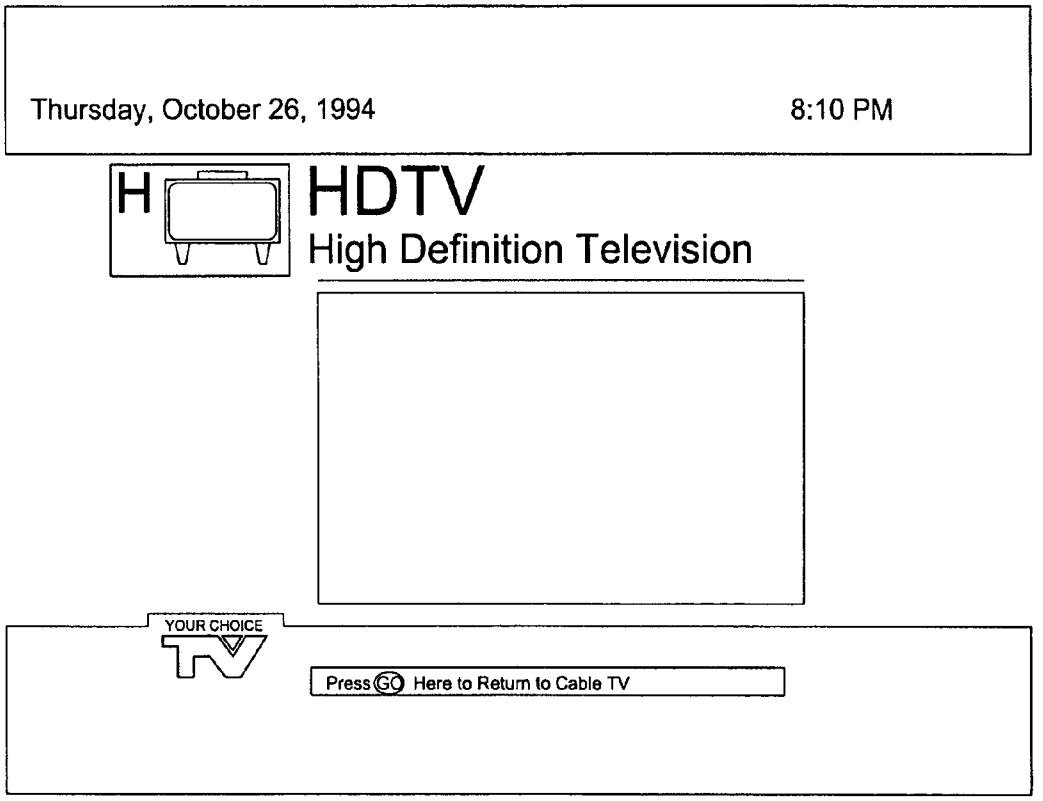

Thursday, October 26, 1994
8:10 PM
H
HDTV
High Definition Television
YOUR CHOICE
TV
Press GO Here to Return to Cable TV

FIG. 119

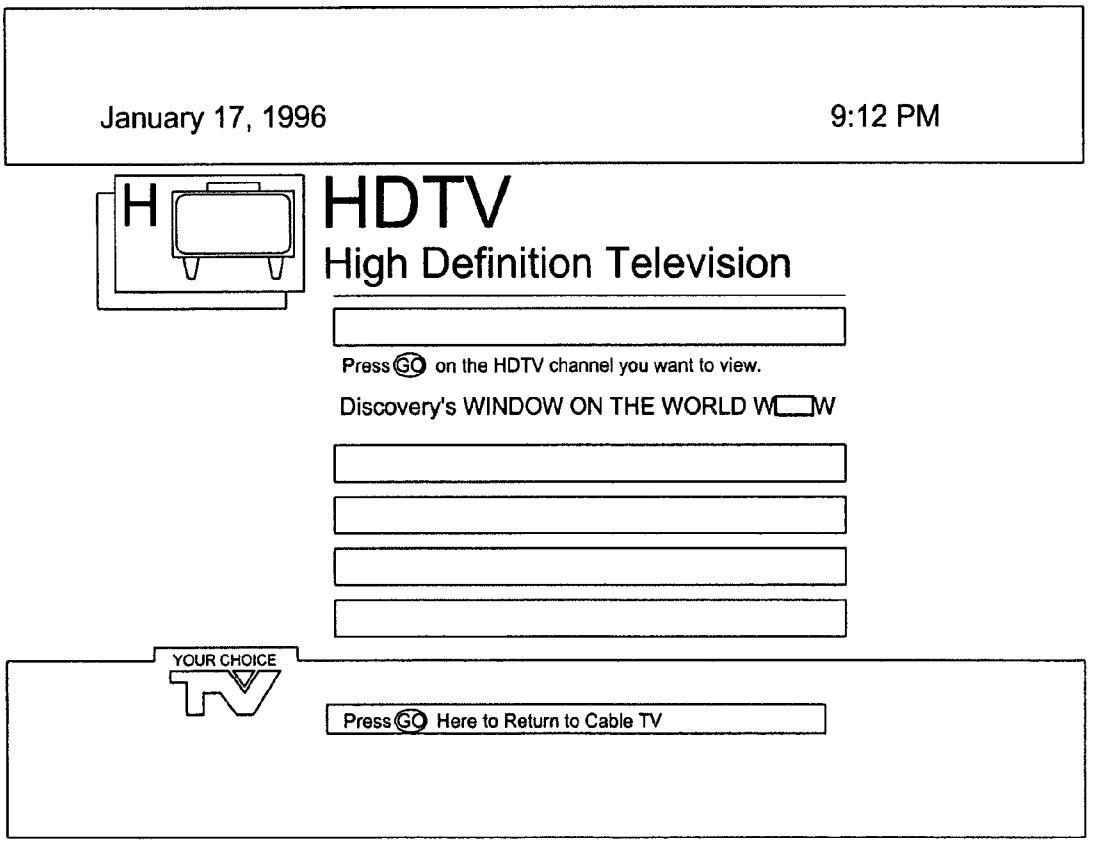

January 17, 1996
9:12 PM
H
HDTV
High Definition Television
Press GO on the HDTV channel you want to view.
Discovery's WINDOW ON THE WORLD W W
YOUR CHOICE TV
Press GO Here to Return to Cable TV

FIG. 120

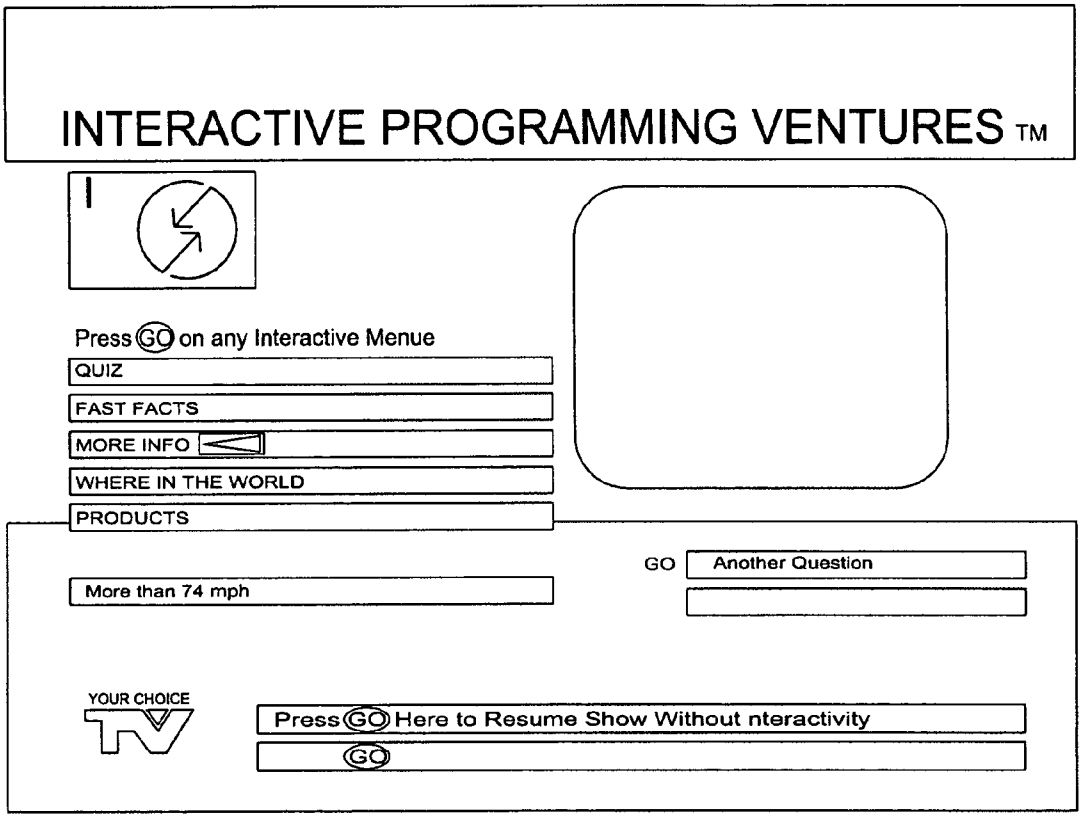

INTERACTIVE PROGRAMMING VENTURES TM
Press GO on any Interactive Menue
QUIZ
FAST FACTS
MORE INFO
WHERE IN THE WORLD
PRODUCTS
More than 74 mph
GO
Another Question
YOUR CHOICE
Press GO Here to Resume Show Without nteractivity
GO

FIG. 121

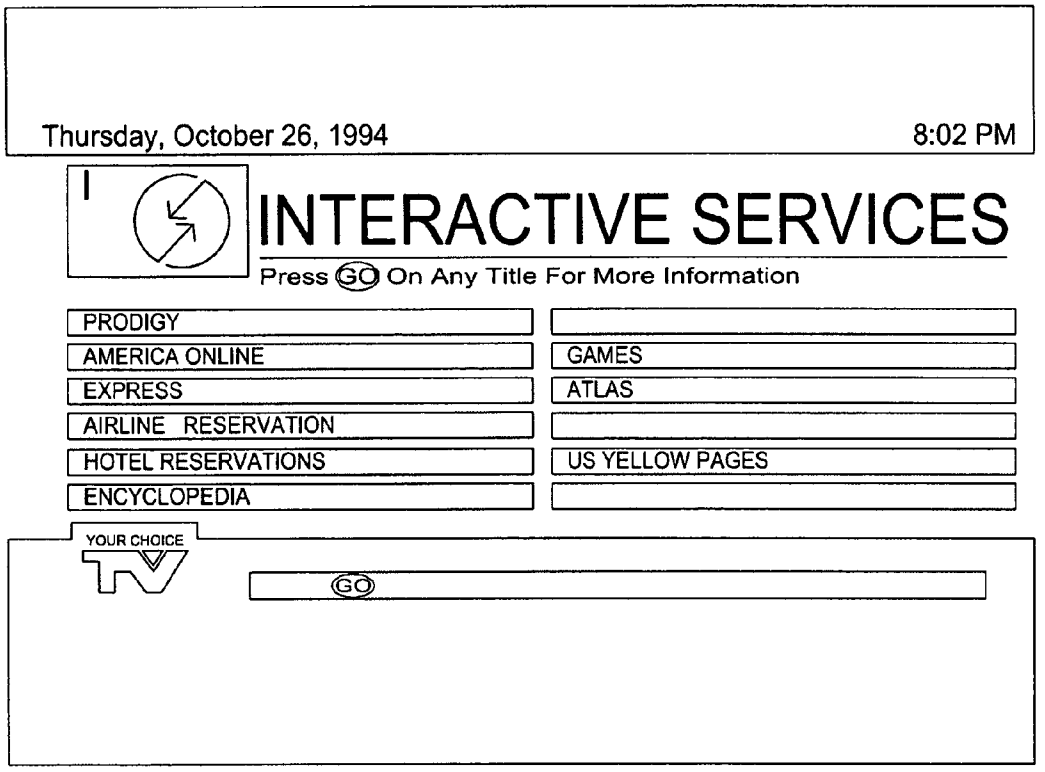

Thursday, October 26, 1994
8:02 PM
INTERACTIVE SERVICES
Press GO On Any Title For More Information
PRODIGY
AMERICA ONLINE
EXPRESS
AIRLINE RESERVATION
HOTEL RESERVATIONS
ENCYCLOPEDIA
GAMES
ATLAS
US YELLOW PAGES
YOUR CHOICE TV
GO

FIG. 122

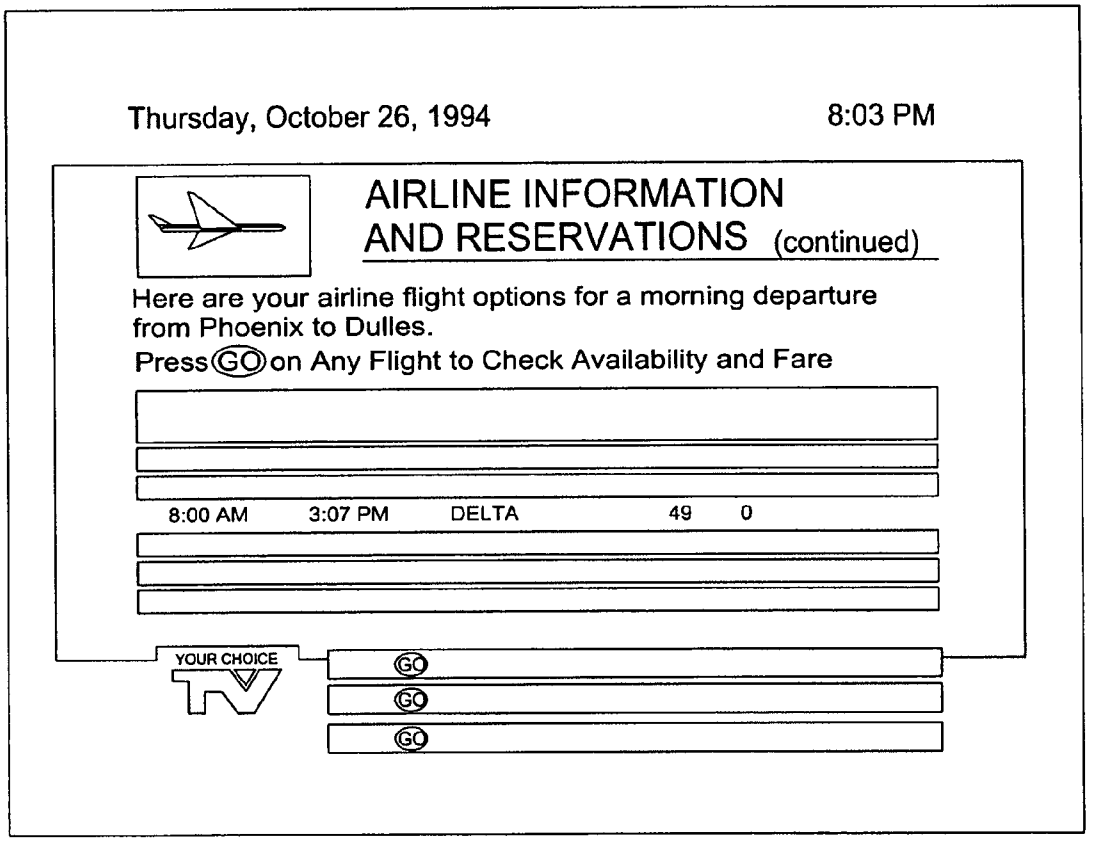

Thursday, October 26, 1994
8:03 PM
AIRLINE INFORMATION
AND RESERVATIONS (continued)
Here are your airline flight options for a morning departure from Phoenix to Dulles.
Press GO on Any Flight to Check Availability and Fare
8:00 AM
3:07 PM
DELTA
49
0
YOUR CHOICE TV
GO
GO
GO

FIG. 123

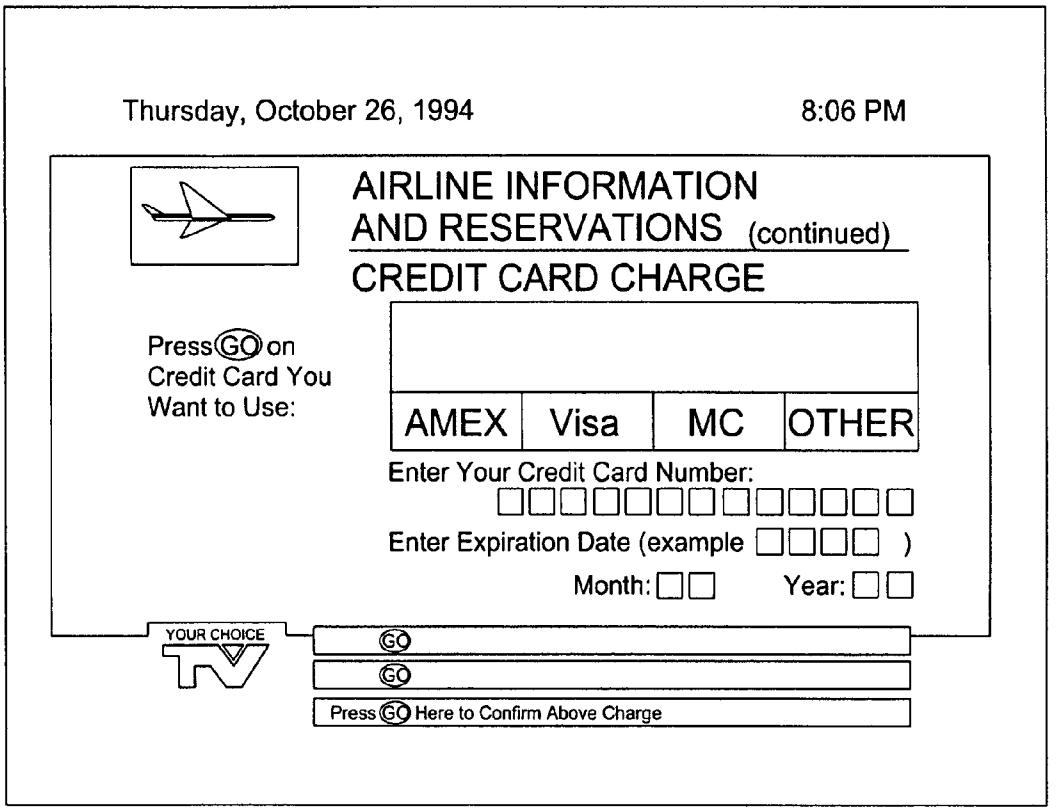

Thursday, October 26, 1994
8:06 PM
AIRLINE INFORMATION
AND RESERVATIONS (continued)
CREDIT CARD CHARGE
Press GO on
Credit Card You
Want to Use:
AMEX
Visa
MC
OTHER
Enter Your Credit Card Number:
Enter Expiration Date (example)
Month:
Year:
YOUR CHOICE TV
GO
GO
Press GO Here to Confirm Above Charge

FIG. 124

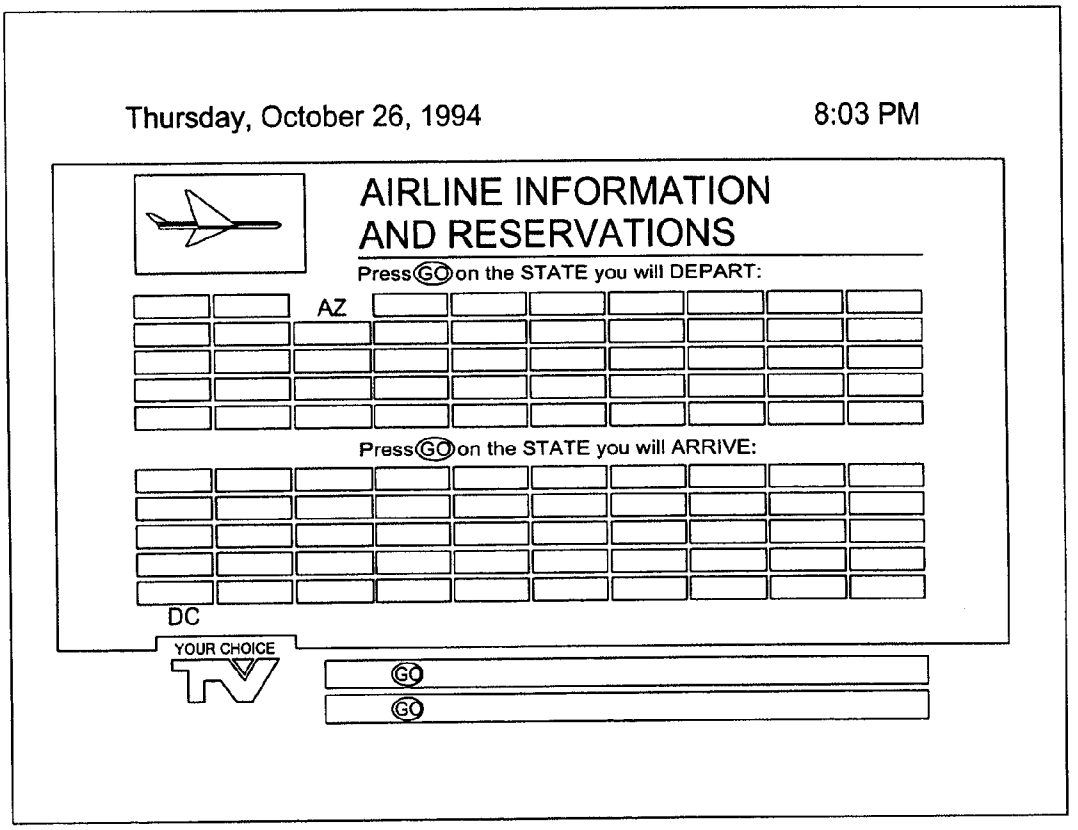

Thursday, October 26, 1994
8:03 PM
AIRLINE INFORMATION
AND RESERVATIONS
Press GO on the STATE you will DEPART:
AZ
Press GO on the STATE you will ARRIVE:
DC
YOUR CHOICE
TV
GO
GO

FIG. 125

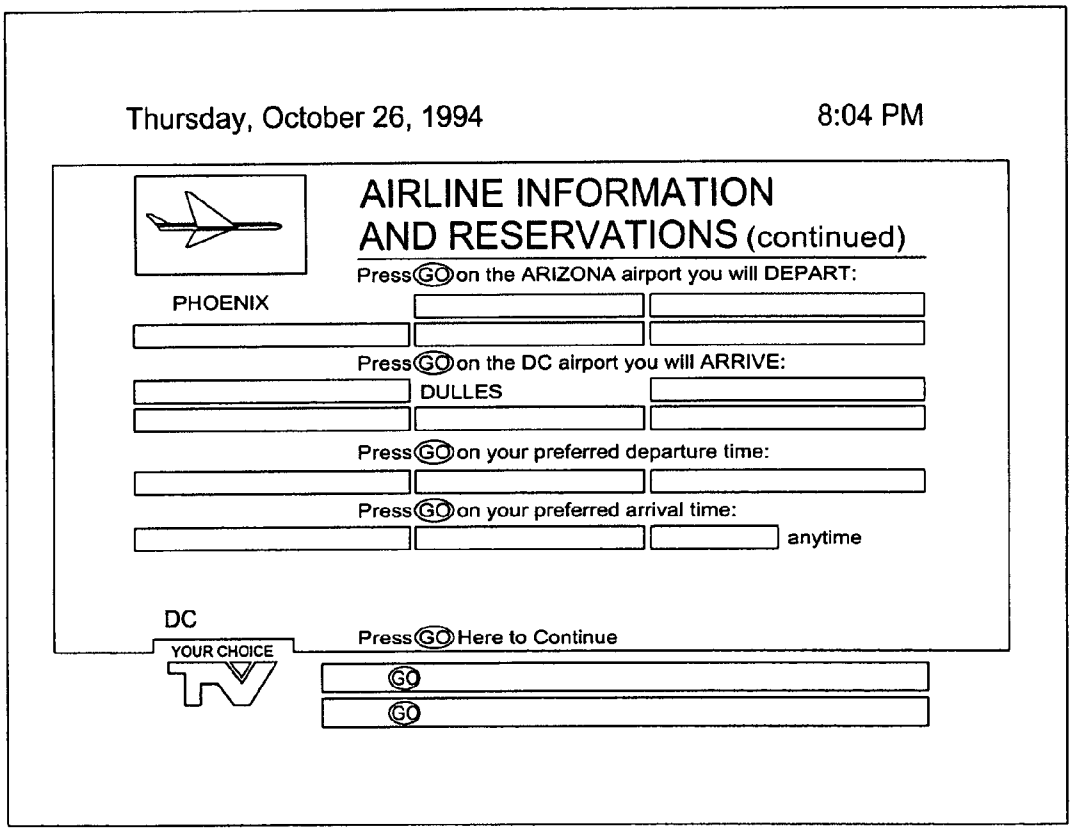

Thursday, October 26, 1994
8:04 PM
AIRLINE INFORMATION
AND RESERVATIONS (continued)
Press GO on the ARIZONA airport you will DEPART:
PHOENIX
Press GO on the DC airport you will ARRIVE:
DULLES
Press GO on your preferred departure time:
Press GO on your preferred arrival time:
anytime
DC
YOUR CHOICE TV
Press GO Here to Continue
GO
GO

FIG. 126

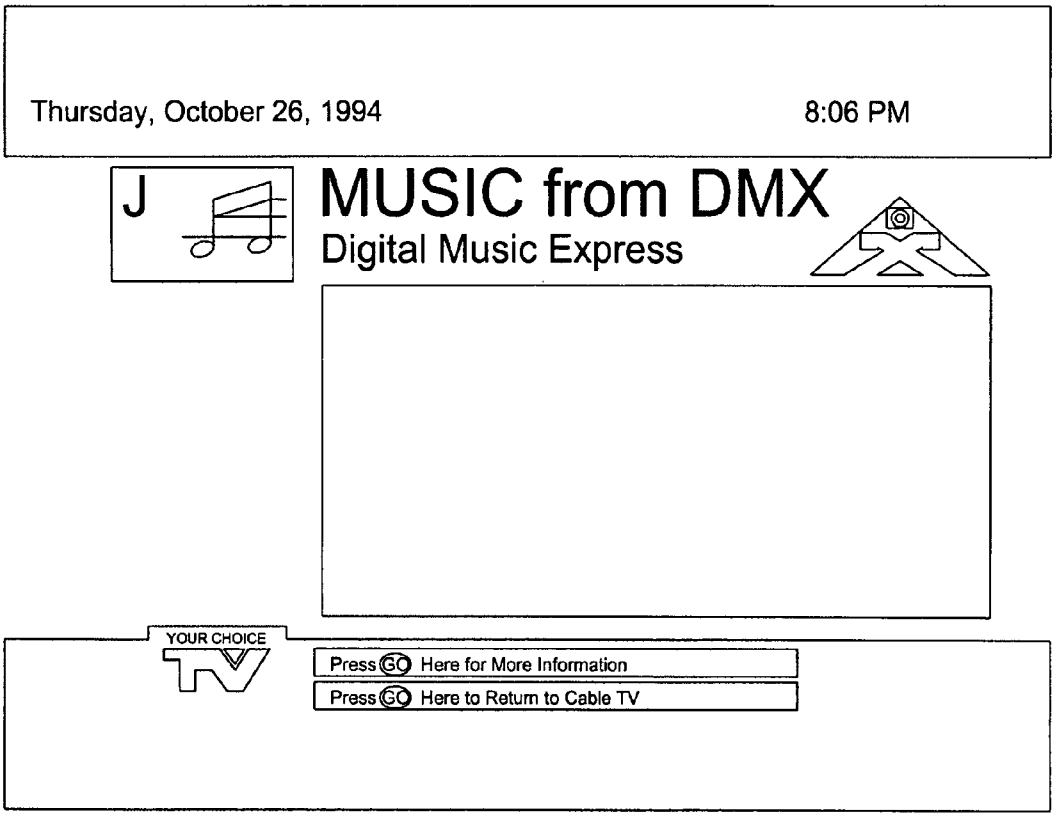

Thursday, October 26, 1994
8:06 PM
MUSIC from DMX
Digital Music Express
YOUR CHOICE
TV
Press GO Here for More Information
Press GO Here to Return to Cable TV

FIG. 127

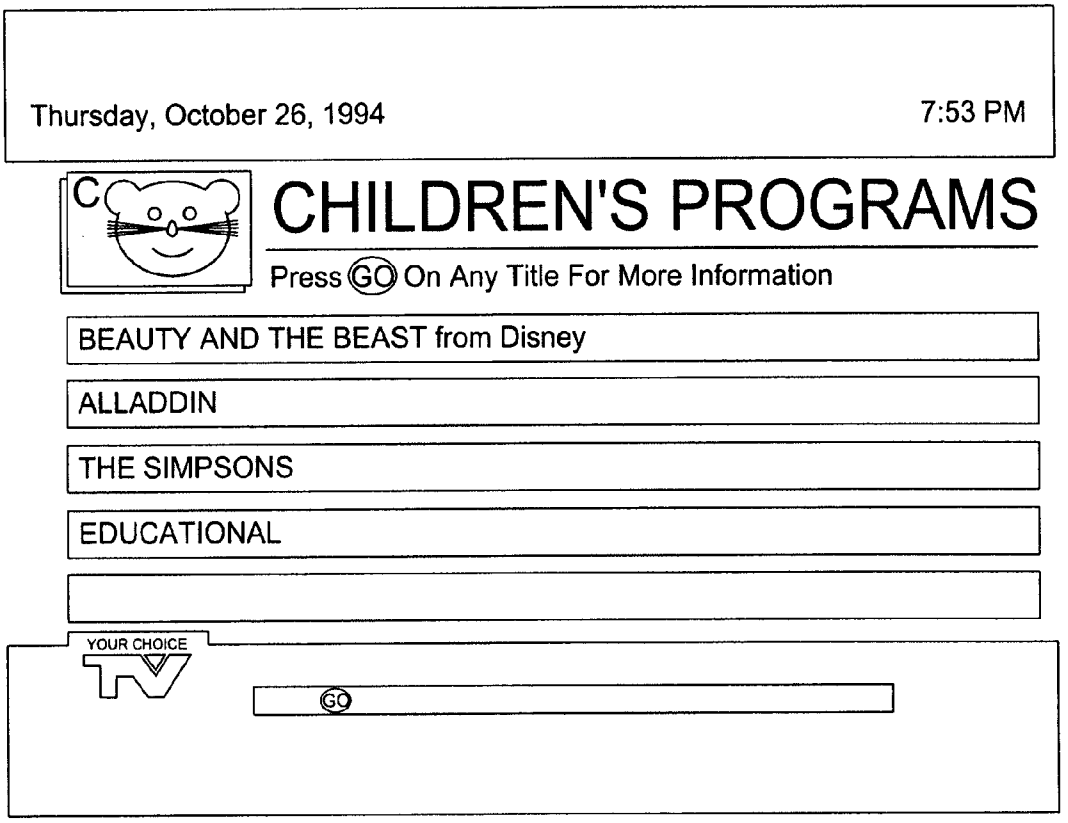

Thursday, October 26, 1994
7:53 PM
CHILDREN'S PROGRAMS
Press GO On Any Title For More Information
BEAUTY AND THE BEAST from Disney
ALLADDIN
THE SIMPSONS
EDUCATIONAL
YOUR CHOICE TV
GO

FIG. 128

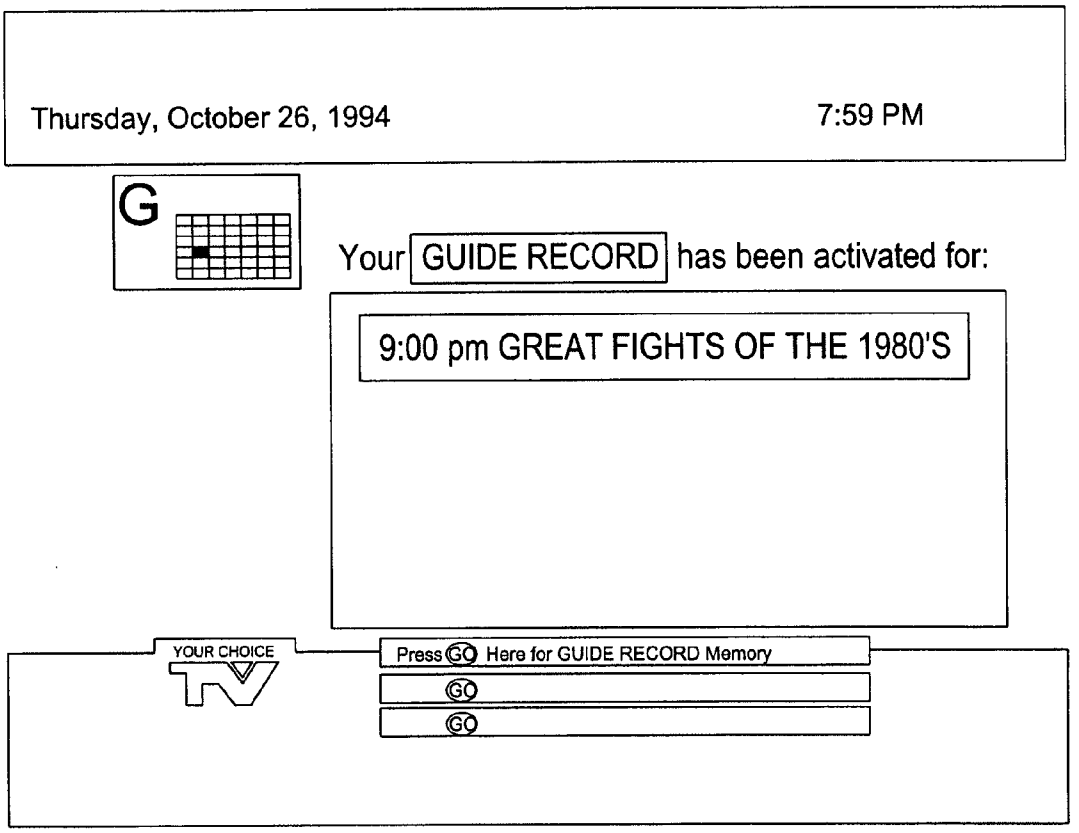

Thursday, October 26, 1994
7:59 PM
G
Your GUIDE RECORD has been activated for:
9:00 pm GREAT FIGHTS OF THE 1980'S
YOUR CHOICE TV
Press GO Here for GUIDE RECORD Memory
GO
GO

FIG. 129

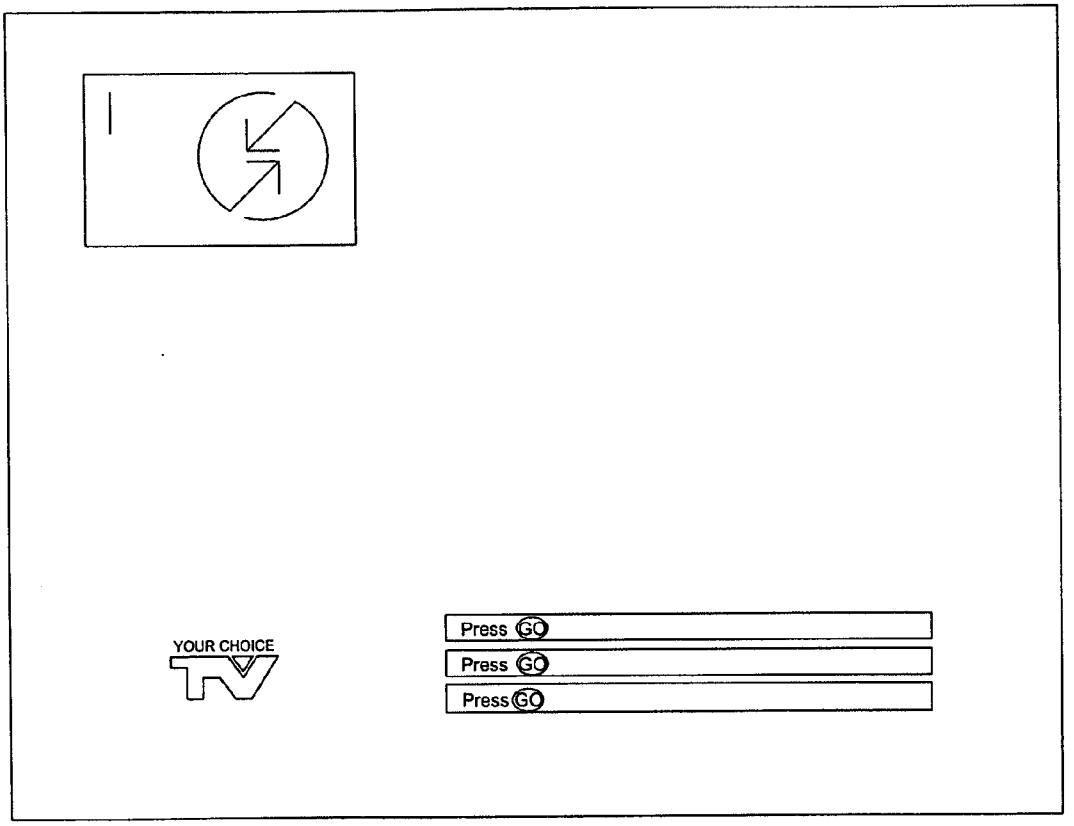


FIG. 130

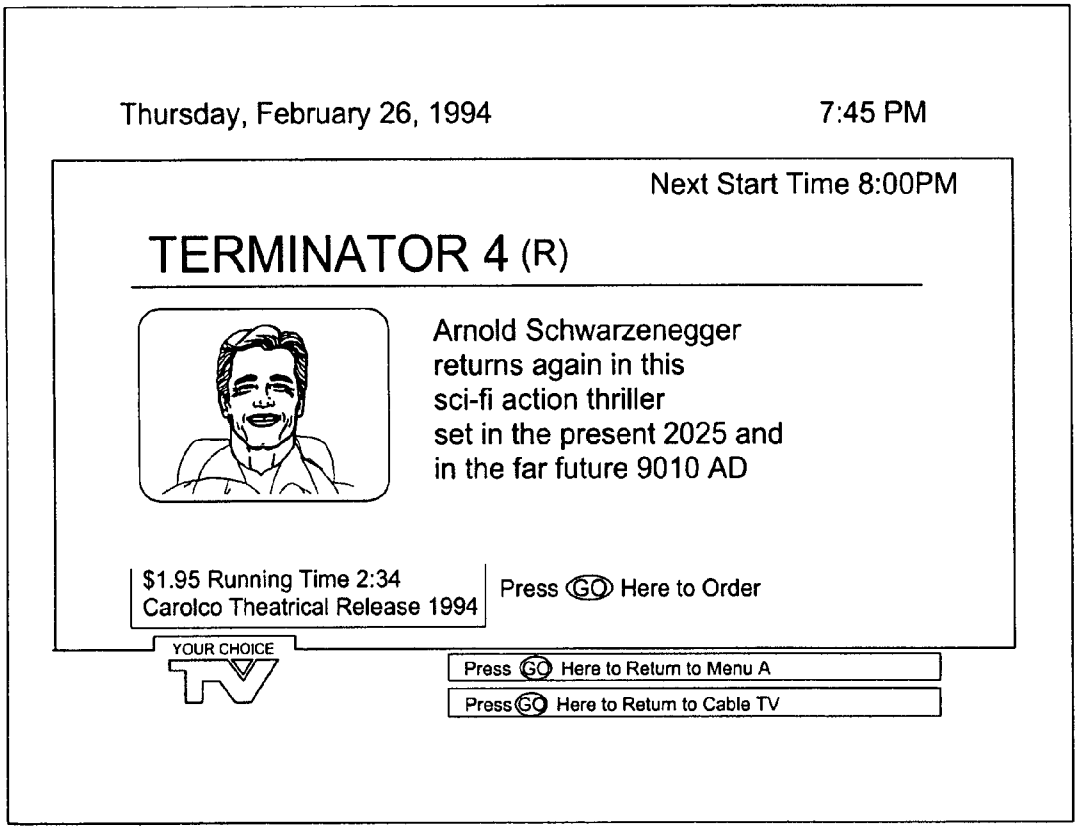

Thursday, February 26, 1994
7:45 PM
Next Start Time 8:00PM
TERMINATOR 4 (R)
Arnold Schwarzenegger returns again in this sci-fi action thriller set in the present 2025 and in the far future 9010 AD
$1.95 Running Time 2:34
Carolco Theatrical Release 1994
Press GO Here to Order
YOUR CHOICE TV
Press GO Here to Return to Menu A
Press GO Here to Return to Cable TV

FIG. 131

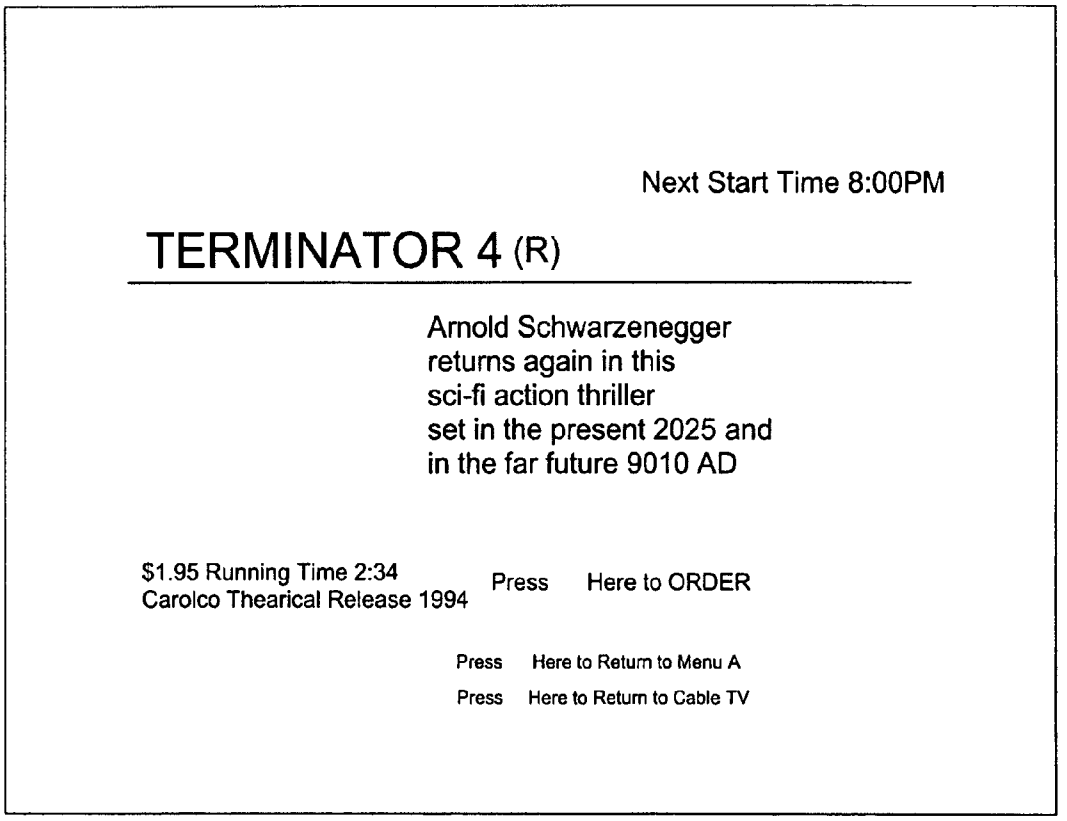

Next Start Time 8:00PM
TERMINATOR 4 (R)
Arnold Schwarzenegger
returns again in this
sci-fi action thriller
set in the present 2025 and
in the far future 9010 AD
$1.95 Running Time 2:34
Carolco Thearical Release 1994
Press Here to ORDER
Press Here to Return to Menu A
Press Here to Return to Cable TV

FIG. 132

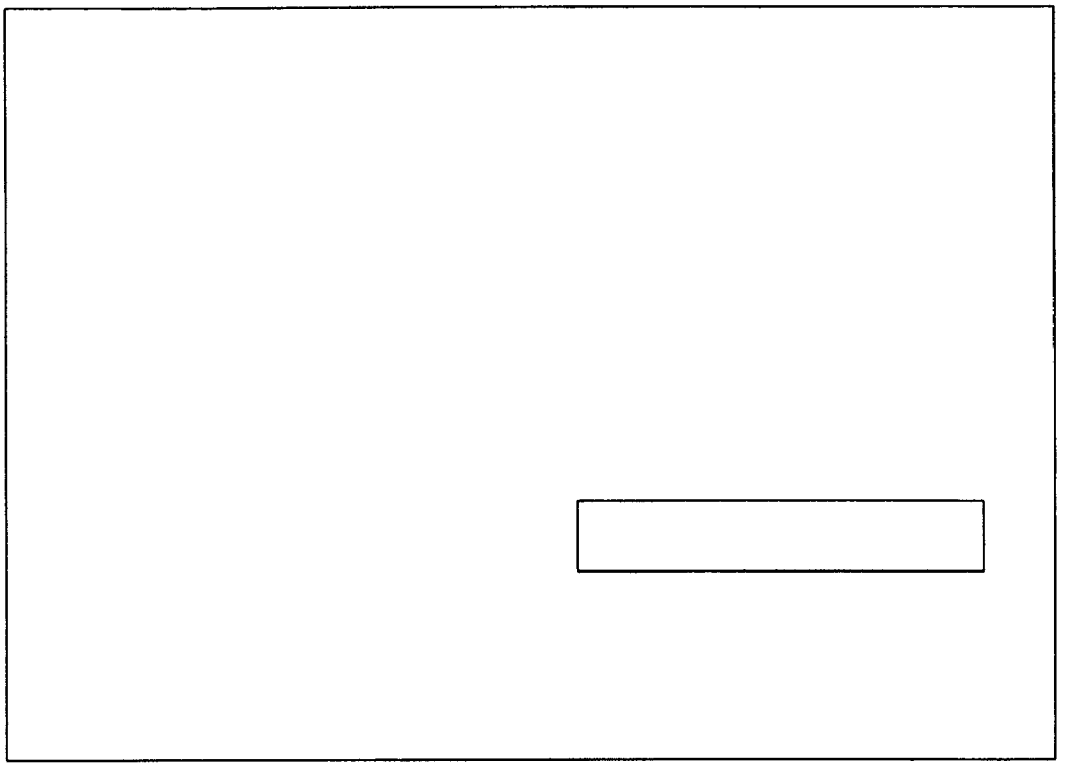


FIG. 133

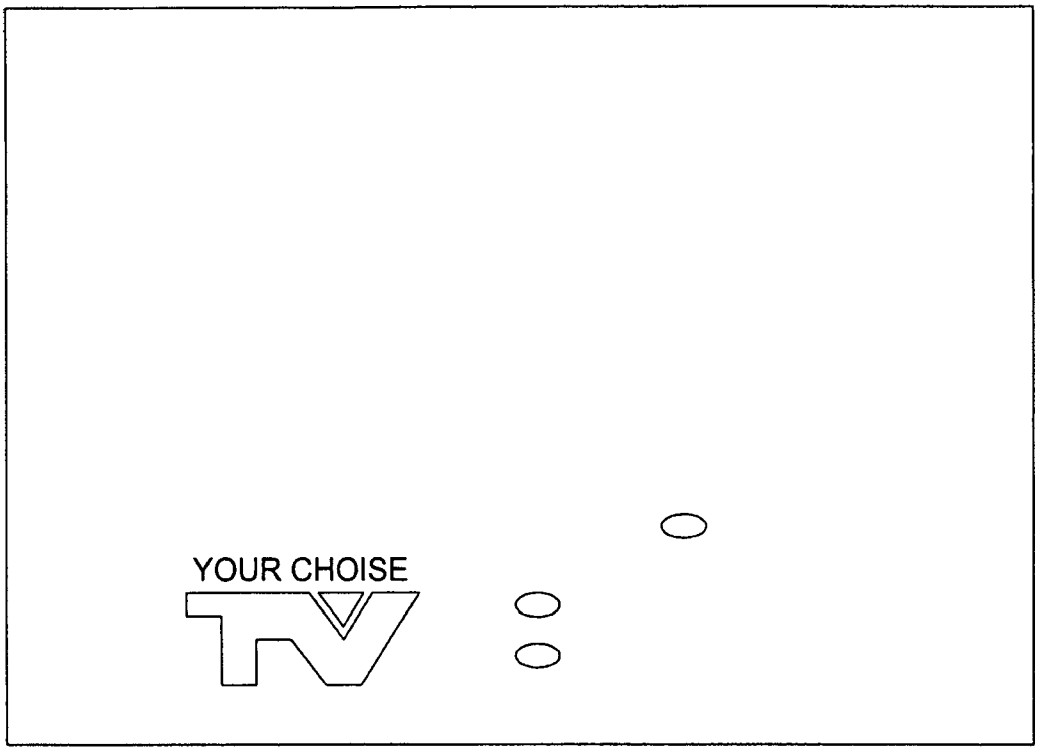


FIG. 134

REMOTE CONTROL FOR MENU DRIVEN SUBSCRIBER ACCESS TO TELEVISION PROGRAMMING

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This patent application is a Continuation of commonly owned U.S. patent application Ser. No. 07/991,074, filed Dec. 9, 1992, the contents of which are incorporated by reference herein.

BACKGROUND OF THE INVENTION

[0002] The invention relates to television entertainment systems for providing television programming to consumer homes. More particularly, the invention relates to cable television packaging, delivery and presentation systems which provide consumers with many television programming options.

[0003] Advances in television entertainment have been primarily driven by breakthroughs in technology. In 1939, advances on Vladmir Zworykin's picture tube provided the stimulus for NBC to begin its first regular broadcasts. In 1975, advances in satellite technology provided consumers with increased programming to homes.

[0004] Many of these technology breakthroughs have produced inconvenient systems for consumers. One example is the ubiquitous three remote control home, having a separate and unique remote control for the TV, cable box and VCR. More recently, technology has provided cable users in certain parts of the country with 100 channels of programming. This increased program capacity is beyond the ability of many consumers to use effectively. No method of managing the program choices has been provided to consumers.

[0005] Consumers are demanding that future advances in television entertainment, particularly programs and program choices, be presented to the consumer in a user friendly manner. Consumer preferences, instead of technological breakthroughs, will drive the television entertainment market for at least the next 20 years. As computer vendors have experienced a switch from marketing new technology in computer hardware to marketing better useability, interfaces and service, the television entertainment industry will also experience a switch from new technology driving the market to consumer useability driving the market.

[0006] Consumers want products incorporating new technology that are useful, and will no longer purchase new technology for the sake of novelty or status. Technological advances in sophisticated hardware are beginning to surpass the capability of the average consumer to use the new technology. Careful engineering must be done to make entertainment products incorporating new technology useful and desired by consumers.

[0007] In order for new television entertainment products to be successful, the products must satisfy consumer demands. TV consumers wish to go from limited viewing choices to a variety of choices, from no control of programming to complete control. Consumers wish to advance from cumbersome and inconvenient television to easy and convenient television and keep costs down. Consumers do not wish to pay for one hundred channels when due to lack of programming information, they seldom, if ever, watch programming on many of these channels.

[0008] The concepts of interactive television, high definition television and 300 channel cable systems in consumer homes will not sell if they are not packaged, delivered and presented in a useable fashion to consumers. The problem is that TV programming is not being managed, packaged, delivered, and presented to consumers in a user friendly manner.

[0009] Consumers are already being bombarded with programming options, numerous "free" cable channels, subscription cable channels and pay-per-view choices. Any further increase in TV entertainment choices, without a user friendly presentation and approach, will likely bewilder viewers with a mind-numbing array of choices.

[0010] The TV industry has traditionally marketed and sold its programs to consumers in bulk, such as continuous feed broadcast and long-term subscriptions to movie channels. The TV industry is unable to sell its programming in large quantities on a unit per unit basis, such as the ordering of one program. Consumers prefer a unit sales approach because it keeps costs down and allows the consumer to be more selective in their viewing.

[0011] Additionally, viewership fragmentation, which has already begun, will increase. Programming not presented in a user friendly manner will suffer with a decrease in viewership and revenue.

[0012] What is needed is an economical system which can gather television programming in a variety of formats, package the programs, deliver the programs, and present the programs through a user friendly interface which allows the consumer to easily select from among the many program choices. The system must be capable of handling hundreds of programs in different formats, be expandable for future types of programming, include a method for billing consumers, and be inexpensive. The present invention is addressed to fulfill these needs.

SUMMARY OF INVENTION

[0013] The present invention is an expanded cable television program delivery system that dramatically increases programming capacity using compressed transmission of television program signals. Developments in digital bandwidth compression technology now allow much greater throughput of television program signals over existing or slightly modified transmission media. The present invention is a program delivery system which provides subscribers with a user friendly interface to operate and exploit a six-fold or more increase in current program delivery capability.

[0014] Subscribers will be able to access the expanded program package and view selected programs through a menu-driver access scheme that allows each subscriber to select individual programs by sequencing a series of menus. The menus are sequenced by the subscriber using simple alpha-numeric and iconic character access, allowing the subscriber to access desired programs by simply pressing a single button rather than recalling from memory and pressing the actual two or more digit numeric number assigned to a selection. Thus, with the press of single buttons, the subscriber can advance from one menu to the next. In this

fashion, the subscriber can sequence the menus and select a program from any given menu. The programs are grouped by category so that similar program offerings are found on the same menu.

[0015] B. System Description

[0016] 1. Major System Components

[0017] In its most basic form, the system uses a program delivery system in conjunction with a conventional cable television system. The program delivery system contemplates (i) at least one operations center, where program packaging and control information are received and then assembled in the form of digital data, and (ii) a digital compression system, where the digital data is compressed, combined/multiplexed, encoded, and mapped into digital signals for satellite transmission (i.e., modulated, upconverted and amplified). The program delivery system transports the digital signals to the concatenated cable television system where the signals are received at the cable headend. Within the cable headend, the received signals may be decoded, demultiplexed, managed by a local central distribution and switching mechanism and then transmitted to subscriber homes via the cable system.

[0018] The delivery system employs an in-home decompression capability employing a decompressor housed within a set-top terminal in each subscriber's home. The decompressor remains transparent from the subscriber's point of view and allows any of the compressed signals to be demultiplexed and individually extracted from the composite data stream and then individually decompressed upon selection of a corresponding program by the subscriber. Within the set-top terminal, video signals are converted into analog signals. Control signals are extracted, decompressed and either executed immediately or place in local storage in a ROM. The program control signals correspond to specific television programs with menu program options that each subscriber may access through a subscriber interface. The subscriber interface is a combined alpha, numeric and iconic remote control device which provides direct or menu-driven program access.

[0019] An array of menu templates are generated by either a computer program within the set-top terminal or by the cable headend. The menu templates are generated using the program control information signals received from the Operations Center. A computer program within the set top terminal generates the on-screen menu displays and allocates a specific menu program option for each program signal. A combined alpha and numeric remote control device provides the user interface to each program signal, allowing selection of a specific menu option which corresponds to a particular program signal.

[0020] 2. Operations Center and Digital Compression System

[0021] The Operations Center performs two primary services, packaging television programs and generating the program control signal. At the Operations Center television programs are accumulated from various sources in both analog and digital form. The programs are then packaged into groups and categories which allow for easy menu access to programs and provides optimal marketing of programs to subscribers. The packaging process also accounts for any groupings by transponder which are necessary. After a packaging scheme is developed, the program control information which, among other things, describes the packaging, is generated by a computer and delivered with the packaged programs to the head end and/or subscriber. The system also accommodates local cable and television companies with programming time for local advertising and/or programming time availability.

[0022] The delivery system employs digital compression techniques to increase existing satellite transponder capacity by at least a 6:1 ratio, resulting in a six-fold increase in program delivery capability. The input signals are compressed, combined and encoded prior to satellite transmission, and subsequently transponded to various receive sites. There are a number of compression algorithms that presently exist which can achieve the resultant increase in capacity and improved signal quality desired for the invention.

[0023] 3. System Control

[0024] Network management, control and monitoring of all compressors and decompressors in the network, is performed by a network controller at the cable headend, where program selection activity, and account and billing information is monitored. In the preferred embodiment, the network controller monitors, among other things, automatic pollback responses from the set-top terminals remotely located at each subscriber's home. The polling and automatic reportback cycle occurs frequently enough to allow the network controller to maintain accurate account and billing information as well as monitor authorized channel access. In the simplest embodiment, information to be sent to the network controller will be stored in ROM within each subscriber's set-top terminal and retrieved only upon polling by the network controller.

[0025] Control information from the set top terminal will be sent to the network controller at the cable headend and not directly to the operations center. The digital compression and delivery system of the preferred embodiment provides a one-way path from the Operations Center to the cable headend. Thus, program monitoring and selection control will take place only at the cable headend by the local cable company and its decentralized network controllers (i.e., decentralized relative to the Operations Center which is central to the program delivery system). The local cable company will in turn be in communication with the operations center or a regional control center which accumulates return data from the set-top terminal for statistical or billing purposes. Alternatively, the operations center, and statistical and billing sites could be collocated.

[0026] 4. Menu-Driven Program Selection

[0027] At a given receive site, any of the compressed signals may be demultiplexed or individually extracted from the data stream and passed from the cable headend over the cable system to the subscriber's set-top terminal. Within the set-top terminal, the individual compressed signals are decompressed and either placed in local storage (from which the menu template may be created), executed immediately, or sent directly to the screen. A combined alpha, numeric and iconic remote control device provides the subscriber interface to the system.

[0028] Through this interface, the subscriber may select desired programming through the system's menu-driven scheme or by directly accessing a specific channel by its

actual number. The menu-driven scheme provides the subscriber with one-step access to all major menus, ranging from hit movies to specialty programs. From any of the major menus, the subscriber can in turn access submenus and minor menus by alpha character access. By using menu-driven, iconic or alpha-character access, the subscriber can access desired programs by simply pressing a single button rather than recalling from memory and pressing the actual channel number to make a selection. The subscriber can access regular broadcast and basic cable television stations by using either the numeric keys on the remote control and pressing the corresponding channel number, or one of the menu icon selection options.

[0029] It is an object of the invention to provide a user friendly interface for subscribers to access television programs.

[0030] It is an object of the invention to efficiently package and deliver television programs to subscriber homes.

[0031] It is an object of the invention to allow users to easily navigate through hundreds of programming choices using on-screen menus.

[0032] It is an object of this invention to allow subscribers to select a program from among hundreds of choices without a television viewing guide.

[0033] It is an object of this invention to efficiently utilize digital compression techniques to deliver hundreds of television program options to subscribers' homes.

[0034] It is an object of this invention to provide pay-per-view type program access in the same system as specialty channel and broadcast television access.

[0035] It is an object of this invention to allow users to subscribe on-screen to specialty channels.

[0036] It is an object of this invention to provide centralized national system of program packaging and delivery for cable television.

[0037] It is an object of this system to provide a centralized program packaging and delivery system with the capability for incorporating local availability of program and advertising time.

[0038] It is an object of this invention to monitor subscriber viewing choices for statistical purposes.

[0039] It is an object of this invention to provide on-screen billing information to subscribers.

[0040] It is an object of this invention to provide sophisticated on-screen television menus which can incorporate still video and moving video.

[0041] It is an object of this invention to provide a system capable of advertising products and services with on-screen television menus.

[0042] It is an object of this invention to provide a user friendly system capable of offering High Definition Television (HDTV) programs.

[0043] It is an object of this invention to provide a user friendly system capable of offering interactive television services.

[0044] It is an object of this invention to provide a user friendly cable system capable of supplying both television programming and digital audio programming.

[0045] It is an object of this invention to provide a system which offers HDTV, interactive services, and digital audio programming.

[0046] It is an object of its invention to provide a more compelling way for cable operators to promote not only their pay per view options, but also to promote their current offerings of cable service through menu and screen generation for local, customized programming of menu screens.

[0047] It is an object of this invention to allow subscribers to access digitally compressed audio channels with the same decompression system used for their television.

[0048] These and other objects and advantages of the invention will become obvious to those skilled in the art upon review of the following description, the attached drawings and appended claims.

DESCRIPTION OF THE DRAWINGS

[0049] **FIG. 1**. **FIG. 1** is a schematic of the overall system design.

[0050] **FIG. 2**. **FIG. 2** is a schematic of the primary components of the invention.

[0051] **FIG. 3***a*. **FIG. 3***a* is a diagram of the bandwidth allocation for a 750 mHz system.

[0052] **FIG. 3***b*. **FIG. 3***b* is a diagram/chart of the compressed channel allocation for the system.

[0053] **FIG. 3***c*. **FIG. 3***c* is a diagram showing how three cable television systems with different bandwidths may use the program delivery system of the present invention simultaneously.

[0054] **FIG. 3***d*. **FIG. 3***d* is a diagram showing three different cable headend systems, each system receiving the entire satellite signal and stripping those parts of the signal which cannot be handled by the local cable system.

[0055] **FIG. 3***e*. **FIG. 3***e* is a diagram showing dynamic change in bandwidth allocation from a typical week day prime time signal.

[0056] **FIG. 4***a*. **FIG. 4** is a block diagram of the Operations Center and Master Control Site.

[0057] **FIG. 4***b*. **FIG. 4***b* is a block diagram of the computer assisted packaging shown in **FIG. 4***a*.

[0058] **FIG. 5**. **FIG. 5** is a flow chart of the processing occurring at the Operations Center.

[0059] **FIG. 6**. **FIG. 6** is a chart of the program control information carried by the program control information signal.

[0060] **FIG. 7***a*. **FIG. 7***a* is a block diagram of the internals of the set top terminal.

[0061] **FIG. 7***b*. **FIG. 7***b* is a block diagram of an alternative embodiment of the internals of the set top terminal.

[0062] **FIG. 8***a*. **FIG. 8***a* is a perspective front view of a set top terminal.

[0063] **FIG. 8***b*. **FIG. 8***b* is a perspective rear view of a set top terminal.

[0064] **FIG. 9***a*. **FIG. 9***a* is a schematic of a basic decompression box and upgrade module, with the associated connections.

[0065] **FIG. 9***b*. **FIG. 9***b* is a schematic of an alternative embodiment of a simple decompression unit and upgrade module, with associated connections.

[0066] **FIG. 10***a*. **FIG. 10***a* is a drawing of storage for on-screen menu templates stored in graphics memory of the set top terminal.

[0067] **FIG. 10***b*. **FIG. 10***b* is a drawing showing the hierarchical storage of graphics memory for the set top terminal.

[0068] **FIG. 10***c*. **FIG. 10***c* is a drawing of a flow chart showing the steps required for the microprocessor to retrieve, combine and display a menu.

[0069] **FIG. 10***d*. **FIG. 10***d* is a drawing of a flow chart showing the steps required for the microprocessor to sequence program menus.

[0070] **FIG. 11***a*. **FIG. 11***a* is a schematic showing the two parts of a remote control unit.

[0071] **FIG. 11***b*. **FIG. 11***b* is a drawing of the complete remote control derived from **FIG. 11***a*.

[0072] **FIG. 12***a*. **FIG. 12***a* is a color photograph showing a perspective view of the preferred remote control unit of the present invention.

[0073] **FIG. 12***b*. **FIG. 12***b* is another drawing of the preferred remote control unit shown in **FIG. 12***a*.

[0074] **FIG. 13**. **FIG. 13** is a flow chart of the progression of primary menus in the menu driven system of the set-top terminal.

[0075] **FIG. 14***a*. **FIG. 14***a* is a drawing of the basic menus used in the present invention, including the ten major menus represented by icons.

[0076] **FIG. 14***b*. **FIG. 14***b* is a drawing of the basic menus used in the present invention, in addition to **FIG. 14***a*.

[0077] **FIGS. 15***a*-**15***b*. **FIGS. 15***a*-**15***b* are drawings of introductory menus.

[0078] **FIGS. 16***a*-**16***d*. **FIGS. 16***a*-**16***d* are drawings of home menus.

[0079] **FIG. 17**. **FIG. 17** is a drawing of an alternative of a home menu.

[0080] **FIGS. 18***a*-**18***g*. **FIGS. 18***a*-**18***g* are drawings of major menus.

[0081] **FIGS. 19***a*-**19***b*. **FIGS. 19***a*-**19***b* are drawings of hit movie description menus.

[0082] **FIGS. 20***a*-**20***b*. **FIGS. 20***a*-**20***b* are drawings of hit movie confirmation submenus.

[0083] **FIGS. 21***a*-**21***b*. **FIGS. 21***a*-**21***b* are drawings of hit movie notification submenus.

[0084] **FIG. 22***a*. **FIG. 22***a* is a drawing of a hit movie escape during program menu.

[0085] **FIG. 22***b*. **FIG. 22***b* is a drawing of a hit movie during program hidden menu.

[0086] **FIG. 22***c*. **FIG. 22***c* is a drawing of a hit movie re-entry submenu.

[0087] **FIG. 23**. **FIG. 23** is a drawing of a movie library major menu.

[0088] **FIG. 24**. **FIG. 24** is a drawing of a hit movie description menu.

[0089] **FIG. 25**. **FIG. 25** is a drawing of a movie library confirmation submenu.

[0090] **FIGS. 26***a*-**26***b*. **FIGS. 26***a*-**26***b* are drawings of major menus.

[0091] **FIGS. 27***a*-**27***b*. **FIGS. 27***a*-**27***b* are drawings of submenus for the major menus shown in **FIGS. 26***a*-**26***b*.

[0092] **FIGS. 28***a*-**28***b*,

[0093] **FIGS. 29***a*-**29***c*. **FIGS. 29***a*-**28***b* and **FIGS. 29***a*-**29***c* are drawings showing examples of submenus for the menus shown in **FIGS. 27***a*-**27***b*.

[0094] **FIG. 30**. **FIG. 30** is a drawing of a specialty channel major menu.

[0095] **FIGS. 31-34**. **FIGS. 31-34** are drawings of submenus related to **FIG. 30**.

[0096] **FIG. 35**. **FIG. 35** is a drawing of a magazine channel major menu.

[0097] **FIGS. 36-38**. **FIGS. 36-38** are drawings of submenus related to **FIG. 35**.

[0098] **FIG. 39**. **FIG. 39** is a drawing of a documentary/news major menu.

[0099] **FIGS. 40-42**. **FIGS. 40-42** are drawings of submenus related to **FIG. 39**.

[0100] **FIG. 43**. **FIG. 43** is a drawing of an entertainment choice major menu.

[0101] **FIG. 44**. **FIG. 44** is a drawing of a submenu related to **FIG. 43**.

[0102] **FIG. 45**. **FIG. 45** is a drawing of a children's programs major menu.

[0103] **FIG. 46**. **FIG. 46** is a drawing of a program description submenu related to **FIG. 45**.

[0104] **FIG. 47**. **FIG. 47** is a drawing of a sports major menu.

[0105] **FIGS. 48**, **FIGS. 49***a*-**49***d*. **FIGS. 48 and 49***a*-**49***d* are drawings of submenus related to **FIG. 47**.

[0106] **FIGS. 50***a*-**50***b*. **FIGS. 50***a*-**50***b* are drawings of menus related to high definition television programming.

[0107] **FIGS. 51***a*-**51***f*. **FIGS. 51***a*-**51***f* are drawings of menus related to program guide services.

[0108] **FIGS. 51***g*-**51***h*. **FIGS. 51***g*-**51***h* are drawings of broadcast television menus.

[0109] **FIGS. 51***i*-**51***k*. **FIGS. 51***i*-**51***k* are drawings of mood question menus.

[0110] **FIGS. 52***a*-**52***c*. **FIGS. 52***a*-**52***c* are drawings of interactive television promotional menus, for Levels A.

[0111] **FIGS. 52***d*-**52***j*. **FIGS. 52***d*-**52***j* are drawings of submenus for interactive television services, Level A.

[0112] **FIGS. 53***a*-**53***l*. **FIGS. 53***a*-**53***l* are drawings of interactive services, Level B, particularly related to on-screen airline reservations.

[0113] **FIGS. 54***a*-**54***e*. **FIGS. 54***a*-**54***e* are drawings of menus for digital audio services.

[0114] **FIGS. 55***a*-**55***g*. **FIGS. 55***a*-**55***g* are drawings of the various overlaying screens necessary for creating a hit movie major menu.

[0115] **FIGS. 56***a*-**56***g*. **FIGS. 56***a*-**56***g* are drawings of the various overlaying screens necessary for creating a hit movie description submenu.

[0116] **FIGS. 57***a*-**57***b*. **FIGS. 57***a*-**57***b* are drawings showing use of split screen techniques.

[0117] **FIGS. 58***a*-**58***b*, **FIGS. 59***a*-**59***b*. **FIGS. 58***a*-**58***b* and **59***a*-**59***b* are drawings of monthly account menus.

[0118] **FIG. 60**. **FIG. 60** is a drawing of the statistical and billing system used in the present invention.

[0119] **FIGS. 61-98**. **FIGS. 61-98** are color photographs of many of the menus presented in the preceding Figures.

[0120] **FIG. 99**. **FIG. 99** is a color photograph showing an enlargement of the cursor movement buttons and the "go" button to activate each menu.

[0121] **FIGS. 100-134**. **FIGS. 100-134** are color photographs of many of the menus presented in the preceding Figures.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0122] **FIG. 1** shows an overview of the cable television menu driven program delivery system **200**. The Operations Center **202** is shown receiving external programming signals which correspond to particular programming categories that are available for a subscriber's viewing. These external signals may be in analog or digital form and may be received via landline, microwave transmission, or satellite. Some of these external signals may be transmitted from the program source to the Operations Center **202** in compressed digital format or other nonstandard digital formats. These external signals are received and packaged along with programming that is stored at the Operations Center **202** (not shown here).

[0123] Examples of external program sources **204** shown in **FIG. 1** are: Sporting events, children's programs, documentaries, high definition TV sources, specialty channels, interactive services, weather, news, and other nonfiction or entertainment. Any source that can provide either audio or video or both may be utilized to provide programming to the Operations Center **202**.

[0124] After packaging, the packaged television program signal is prepared for satellite transmission **206** and sent from the Operations Center **202** to the cable headend **208** via satellite transmission **206**. Depending on the specific embodiment, the television program signal may need to be compressed, combined/multiplexed, encoded, mapped, modulated, upconverted and amplified. This system, which is intended to be compatible with existing C and Ku Band satellite transmission **206** technologies, accepts video, audio and data signals ranging in signal quality, and input from a number of sources.

[0125] Upon receipt of the programming signal at the cable headend **208**, the signal is again treated if necessary and sent into a concatenated cable system to the subscriber's home. The signal reaches the subscriber's home in a compressed format and must be decompressed prior to viewing. Included in the delivered program signal is information which enables equipment at the subscriber's home to display menus for choosing particular programs. Depending on the particular embodiment, the television program signal may arrive at the subscriber's home via one or more coaxial cables, fiber cables, twisted pairs, cellular telephone connections, or personal communications network (PCN) hook-ups.

[0126] This connection between the subscriber's home and the cable headend **208** allows for two-way communications. Utilizing this two-way communications, the cable headend **208** receives information about a subscriber's account, billing, and programs viewed. Also, the cable headend **208** is capable of sending computer data or computer software information to the subscriber's home.

[0127] As shown in **FIG. 1**, an analog cable TV system **210** can continue to exist alongside and within the digitally compressed system of the present invention. The digital transmissions do not effect the analog system. In fact, the analog cable signal may be transmitted simultaneously on the same cable as the digital signal. The cable headends may continue to supply subscribers with local channels in an analog signal format.

[0128] **FIG. 2** shows a more detailed overview of the operation of the present invention. The Operations Center **202** shown performs program packaging and delivery control. In the preferred embodiment, the packaged program signal will be treated at a master control uplink site **211** prior to being transmitted to the satellite **206**. Various satellite multi-accessing schemes and architectures can be used with the system, including both single channel per transponder time division multiplex (TDM) and multiple channel per transponder single channel per carrier (SCPC). Time division multiplexing is the more desirable scheme. The signal is transmitted from the satellite **206** to the cable headend **208** where a computer system including a digital switch treats the signal and delivers it through cables to a subscriber's home. In alternate embodiments, multiple Operations Center **202** and multiple uplink sites can be simultaneously utilized.

[0129] In the embodiment shown in **FIG. 2**, two cables **216** are used between the cable headend **208** and the subscriber's home. In this particular embodiment, analog signals, digitally compressed signals, other digital signals and up-stream/interactivity signals are sent and received over the two cables **216**.

[0130] The cable headend **208** receives the digitally compressed and multiplexed signal from the satellite **206** and processes the signal for further distribution to the subscriber homes. The cable headend **208** performs two primary functions in the cable delivery system. It will act as a signal processor **212** and distribution center for routing the digitally compressed signals to subscribers and it will act as a network controller **214** receiving information from subscrib-

ers and passing the information on to the Operations Center **202** or other remote sites (such as regional, statistical and billing sites not shown). In order to perform these two functions, the cable headend **208** of the preferred embodiment is equipped with two computer processors working in unison. Use of two processors performing different functions increases the speed and capability of the cable headend **208** without a significant increase in cost. One processor, the signal processor **212**, handles the receiving and processing of the satellite **206** signal for distribution to subscribers. The second processor acts as a network controller **214** and monitors activity of the subscriber's set top terminal **220**. The cable headend **208** can be operated by one CPU or a series of CPU's which perform the signal processing and network control functions.

[**0131**] The signal processor **212** will treat the signal as necessary for use by the subscriber's set top terminal **220**. In the simplest embodiment, the amount of processing that is necessary by the signal processor **212** is limited to demultiplexing and frequency allocation. However, in alternative embodiments, the signal processor **212** demultiplexes the signal, allocates frequencies and then re-multiplexes the signal using a different multiplexing scheme prior to the signal's distribution to the subscriber. In addition, for embodiments in which the control of local availability time is desired at the cable headend **208**, the signal processor **212** must be capable of compressing and adding additional signals to the satellite **206** signal. In order to incorporate local programming, the signal processor **212** would demultiplex the satellite **206** signal, compress the local programming, combine the compressed local program with the satellite **206** signal and then multiplex the signal prior to delivery to the subscriber terminals. Most of the activities necessary for incorporating local programming will be automatically performed by the signal processor **212**. In the preferred embodiment, the signal processor **212** incorporates all the necessary digital switching capability to serve numerous subscribers.

[**0132**] Signals received by the cable headend **208** must be decompressed before transmission from headend to subscriber location only when the compression algorithm used for the cable system differs from the one used for satellite transmission **206**. This difference may result from different bandwidth constraints between the cable transmission media and the satellite **206** transponder. Such a difference would necessitate the use of separate compression algorithms to maintain desired signal quality and throughput over both of the transmission mediums.

[**0133**] System control is performed by the network controller **214**. The primary task of the network controller **214** at the cable headend **208** is to manage the configuration of the set top terminals, which includes receiving and processing signals from the set top terminal units. The network controller **214** must also monitor selections at subscribers' homes, maintain accurate account and billing information, authorize subscriber channel access, and authorize particular set top terminals to operate in the system. Information required to operate the network will be stored in memory (either in RAM, ROM, magnetic or optical Read/Write) at the cable headend **208** and also in memory (RAM and/or ROM) within each subscriber's set top terminal **220**. Two-way communications between the network controller **214** and set top terminal **220** will occur over cable lines. Interactive television programming can be accommodated through the network controller **214**. In addition, the network controller **214** will be able to access set top terminals via phone lines for trouble shooting, special features or sophisticated reprogramming.

[**0134**] The network controller **214** regularly polls each set top terminal **220** to acquire needed information to operate the system. The network controller **214** sends signals to set top terminals to authorize their operation and to authorize access to specific channels. If a subscriber has failed to pay a recent bill, the network controller **214** can deauthorize the subscriber's set top terminal **220**. When a subscriber orders a program or channel the network controller **214** checks the subscriber's account for good standing and then authorizes the access by signaling the set top terminal **220**.

[**0135**] To perform its functions, the network controller **214** must work closely with the signal processor **212**. In many instances the program control information signal received from the Operations Center **202** must be modified prior to being sent to the set top terminals. These modifications to the program control information are made by the network controller **214** working in conjunction with the signal processor **212** to send a set top terminal **220** control information stream (STTCIS). From the signal processor **212**, the network controller **214** receives the program control information signal which includes cable franchise specific information added by the Operations Center **202**. The network controller **214** modifies the program control information signal, if necessary, and communicates the new information to the signal processor **212**. The signal processor **212** then forwards the information to the set top terminal **220** in the form of the STTCIS. In most instances the network controller **214** will modify the program control information signal by adding additional information. In a simple embodiment the program control information signal can be passed through the cable headend **208** to the set top terminal **220** without any modifications.

[**0136**] Although the signal processor **212** will handle the addition of simple local availabilities (e.g. local advertisements) into the signal sent to the set top terminal **220**, the network controller **214** will handle any of the more sophisticated local programming needs such as interactive programming and certain data services. The network controller **214** will receive any electronic signals sent by the set top terminal **220** including those in response to interactive service requests and some data service requests. The network controller **214** coordinates the necessary switching and access to allow the subscriber to enjoy these services.

[**0137**] The network controller **214** has the capability of performing "on the fly programming" changes, assisting in masking portions of subscriber's television screens (split screen video), assist in selecting different audio signals for the same video (foreign languages), assist in interactive features, create tiered programming, etc. For last minute changes to programming (such as for a local emergency or important regional events), an operator using the network controller **214** can modify the program control information signal "on the fly" and change menus available to the subscriber. This accommodates short notice changes to program packaging that can not be provided to the Operations Center **202** in advance. In order to accommodate split screen techniques for promo and demo video (which will be

described later), those undesired video portions of the screen must be masked. The network controller **214** can send the necessary control information to inform the set top terminal **220** to mask portions of a specific channel's video. For example, a video channel with a split screen showing four separate videos would require a ¾ mask to focus the viewer on the featured video clip.

[**0138**] Tiered programming allows different users to view different video even though they are "tuned" to the same channel. For example, the network controller **214** may know the demographics of its subscriber's through a database, by "learning" from prior subscriber choices, from an interactive selection, or from other means. Using the demographics information, the network controller **214** may target commercials to the correct audience by showing different commercials to subscriber's with different demographics. Even though subscriber's will believe they are "tuned" to one channel, they will be switched to a different channel for the tiered video. Alternatively, the subscriber's may be offered an option of several commercials from which to choose.

[**0139**] To accommodate foreign speaking subscribers, multiple audio channels for television programming may be provided. The subscriber may be shown menus of programs available in his native language. The function of choosing the correct audio to correspond to the selected language may be handled by either the set top terminal **220** or the network controller **214** depending upon the configuration. Local programming in several languages or additional audio channels for a foreign language translation of a popular television program may be provided by the network controller **214**. Using a picture-on-picture feature, sign language may be similarly made available to certain set top terminals for the deaf. Also, a text overlay may be easily produced on the lower part of the screen for the deaf.

[**0140**] In the more sophisticated and expensive embodiments, the network controller **214** can act as a central computer and provide intra-set top terminal interactive games, inter-set top terminal interactive games, computer bulletin board type services, message services (Electronic mail) etc. For example, a subscriber may play war games with six of his (anonymous) fellow subscribers each in their own home each operating a separate tank. The network controller **214** gathers the players via set top terminal communications and acts as the referee. A bulletin board or message system can be set up to discuss a particular program such as "Twin Peaks Whodunit" for enthusiasts. These interactive features are further described below with the interactive services level B menu and the set top terminal hardware upgrade level B interactive unit.

[**0141**] Also shown in **FIG. 2** is the set top terminal **220** that receives the signals from the cable headend **208** and manipulates them for the subscriber. The set top terminal **220** is equipped with local computer memory and the capability of interpreting the digitally compressed signal to produce menus for the subscriber. Although the set top terminal **220** is shown on top of the subscriber's television **222**, it may be placed anywhere in the subscriber's home that is accessible by the remote control. The remote control communicates the subscriber's selections to the set top terminal **220**. The subscriber's selections are generally based upon menus or other prompts displayed on the television screen. A typical menu is shown in **FIG. 2** on the television screen.

[**0142**] One of the achievements of the present invention is effective utilization of digital compression technology by packaging television programs into categories that allow easy access to television programs by consumers. With current digital compression techniques for video, the typical 50-channel capacity cable satellite receiving system can be increased to 300 channels. Presently, one transponder is used for each satellite delivered channel. The preferred embodiment uses 18 satellite transponders and compression ratios of 4/1 to 8/1 to achieve a capacity of 136 satellite delivered channels. More transponders or higher compression ratios can be used to deliver up to the channel capacity of any existing cable system.

[**0143**] Typical program packaging and delivery first involves the digitizing of the video signals. This is then followed by one of a variety of digital compression techniques that are available. Following compression the channels must be multiplexed and sent to the satellite **206** dish that will provide the uplink. A variety of multiplexing schemes may be used in the system. In some situations, it may be advantageous to use different multiplexing schemes in different parts of the overall system. In other words, one multiplexing scheme may be used for satellite transmission **206** and a second remultiplexing scheme for the land transmission.

[**0144**] Once the signal has arrived at the uplink or master control site, it must be modulated, upconverted, and amplified. Various types of satellites and transponders capable of handling digital signals may be used in this cable television packaging and delivery system. An example of a digital satellite that may be used is the AT&T Telstar **303**.

[**0145**] In order to achieve the required throughput of video and audio information for the system, digital compression techniques for video are employed. A television signal is first digitized. The object of digitization is two-fold: First, in the case of an analog signal, like a television picture, digitization allows the signal to be converted from a wave-form into a digital binary format. Secondly, standard digital formats are designed to have the resulting pictures or video stills take up less space on their respective storage mediums. Essentially, standard digital formats define methods of compression.

[**0146**] A video screen is divided into picture elements known as pixels. Images define one pixel at a time are referred to as "bit-mapped" images. Most compression techniques take the bit-mapped images and convert them into a series of mathematical algorithms both to reduce storage space and to allow for the mathematical manipulation of images that is often not possible with analog formats. This is possible because many images have pixels that repeat themselves. For example, a photograph of a blue, cloudless sky will have a great number of "repeating" picture elements. This redundancy can be represented with great precision by mathematical formulas. Finally, once images have digitized, the standard digitized formats also include techniques required to re-render the images into their final form, either fully bit-mapped or into an analog wave-form. There are three basic digital compression techniques: within-frame (intraframe), frame-to-frame (interframe), and within-carrier. Intraframe compression processes each frame in a television picture to contain fewer visual details and, therefore, the picture contains fewer digital bits. For example,

information on blocks of pixels is sent rather than individual digitized pixels themselves. A six by six block of pixels contains thirty-six pixels. Each pixel can be defined by an eight-bit word. Therefore, a six by six block of pixels equals two hundred eighty-eight bits. If the information on the block rather than the individual pixels themselves, is transmitted, this reduces the amount of information transmitted. Blocks of various sizes may be used as is known by those skilled in the art.

[0147] Interframe compression transmits only changes between frames, thus omitting elements repeated in successive frames. Motion prediction technology and motion detection technology are necessary to determine what portions of a changing picture may be compressed. Therefore, if a block does not vary between several frames, the block is transmitted once, and repeated at the receive site for successive frames.

[0148] Within-carrier compression allows the compression ratio to dynamically vary depending upon the amount of changes between frames. If a large number of changes occur between frames, the compression ratio drops from, for example, sixteen-to-one to eight-to-one. If action is intense, the compression ratio may dip to four to one.

[0149] Various compression methods are used for the above techniques. In vector quantization, a block is compared to a library of standard blocks and a best fit comparison is made between the two. Each block in the library has a corresponding sixteen bit code. Only this code is transmitted to represent the block, rather than the actual block of pixels itself. Therefore, a two hundred eighty-eight bit block of pixels is converted into a sixteen bit code resulting in a compression ratio of: 288 bits/16 bits=18. The converse process is performed at the receive site to convert the sixteen bit codes into two hundred eighty-eight bit blocks for reproduction on a television receiver. Other types of compression are known to those skilled in the art, including, for example, discrete cosine transform ("DCT").

[0150] Several standard digital formats representing both digitizing standards and compression standards have been developed. For example, JPEG (joint photographic experts group) is a standard for single picture digitization. Motion picture digitization may be represented by standards such as MPEG or MPEG2 (motion picture engineering group specification). Other proprietary standards have been developed in addition to these. Although MPEG and MPEG2 for motion pictures are preferred in the present invention, any reliable digital format with compression may be used with the present invention.

[0151] Various hybrids of the above compression techniques have been developed by several companies including AT&T, Compression Labs, Inc., General Instrument, Scientific-Atlanta, Philips, and Zenith. As is known by those skilled in the art, any of the compression techniques developed by these companies, and other known techniques, may be used with the present invention.

[0152] **FIG. 3***a* shows effective allocation of 750 mHz of bandwidth for television programming. In **FIG. 3***a* bandwidth is allocated for both analog and digitally compressed signals. In the preferred embodiment, the bandwidth is divided so that each category of program receives a portion of the bandwidth. These categories correspond with major menus of the user interface software. The representative categories shown in **FIG. 3***a* include: (1) high definition TV made possible through the use of compression technology, (2) A La Carte Channel category which provides specialty channels for subscription periods such as monthly, and (3) pay-per-view.

[0153] **FIG. 3***b* shows a chart of compressed channel allocation for a variety of programming categories that have been found to be desirable to subscribers. By grouping similar shows or a series of shows into blocks of channels, the system is able to more conveniently display similar programming with on-screen television menus. For example, in the movie category, which has the greatest allocation of channels, the same movie may be shown continuously and simultaneously on different channels. Each channel starts the movie at a different time allowing the subscriber to choose a more suitable movie starting time.

[0154] In order to accommodate cable TV systems that have different bandwidths and channel capacities, the television programming and television program control information may-be divided into parts such as priority one, two, three. The large bandwidth cable TV systems can accommodate all the parts of the television programming and all parts of the television programming control information. Those cable TV systems with a more limited bandwidth are able to use the program delivery system **200** by only accepting the number of parts that the cable system can handle within its bandwidth.

[0155] For instance, as is shown in **FIG. 3***c*, three cable television systems with different bandwidths may use the program delivery system **200** simultaneously with each system accepting only those parts of the information sent which it is capable of handling. Priority one television programming and menus **230** are accepted by all three systems. Priority two television programming and menus **233** are not accepted by the cable television system whose capacity is the smallest or in this case 330 mHz (40 channels) system. Priority two television programming and menus **233** are accepted and used by the two larger capacity cable television systems shown. Priority three television programming and menus **236** are only used by the largest capacity television system which is capable of handling all three parts—Priority one, two and three programming and menu information.

[0156] With this division of television programming and menus, the program delivery system **200** may be utilized simultaneously by a variety of concatenated cable systems with varying system capacities. By placing the heavily watched or more profitable programming and menus in the Priority one division, both users and owners of the cable TV systems will be accommodated as best as possible within the limited bandwidth.

[0157] **FIG. 3***d* shows three different cable headend **208** systems, each system receiving the entire satellite signal from the Operations Center **202** and stripping those parts of the signal which cannot be handled by the local cable system due to bandwidth limitations. In this particular embodiment, the three local cable television systems shown have bandwidth limitations which correspond with the bandwidth limitations depicted in the previous **FIG. 3***c*. As the bandwidth decreases, the programming options available to the viewer in the exemplary on-screen menu decreases. Using

this preferred embodiment, the Operations Center **202** is able to send one identical signal to the satellite **206** that is sent to all the cable headends. Each cable headend **208** accepts the entire signal and customizes the signal for the local cable system by stripping those portions of the Operations Center **202** signal that are unable to be handled by the local cable system. An alternate embodiment requires the Operations Center **202** to send different signals for reception by different capacity cable headends.

[**0158**] There are several ways in which the cable headend **208** may strip the unnecessary signal from the Operations Center **202**. A person skilled in the art will derive many methods from the three examples discussed below. One simple method is for the cable headend **208** receiver to receive the entire signal and then manipulate the signal to strip away those unnecessary portions. A second method is for the signal to be sent in three portions with each portion having a separate header. The cable headend **208** would then recognize the headers and only receive those signals in which the proper header is identified. For the second method, the Operations Center **202** must divide the signal into three parts and send a separate header lead before each signal for each part.

[**0159**] The third and preferred method is for a set of transponders to be assigned to one priority level and each cable headend **208** to receive signals from the transponders corresponding to the proper priority level. For example, if there are three priority levels and 18 transponders, transponders one through nine may be assigned to priority level one, transponders ten through fourteen priority level two, and transponders fifteen through eighteen assigned to priority level three. Thus, a cable headend **208** capable of operating at priority level two only would only receive signals from transponders one through nine, and ten through fourteen.

[**0160**] In addition to dividing the television programming and menus into parts, the Operations Center **202** of the preferred embodiment is also capable of dynamically changing the bandwidth allocation for a particular category of programming. **FIG. 3***e* depicts this dynamic change in bandwidth allocation from a typical week day prime time **238** signal to a Saturday afternoon in October **240** (during the college football season). **FIG. 3***e* highlights the fact that the bandwidth allocated to sports is limited to eight selections during week day prime time **238** but is increased to sixteen selections during a Saturday afternoon in October **240**. This dynamic increase in bandwidth allocation allows the system to accommodate changes in programming occurring on an hourly, daily, weekly, monthly, seasonal and annual basis.

[**0161**] In addition to dynamically allocating bandwidth for programming categories, the Operations Center **202** can also dynamically change the menu capacities in order to accommodate the change in programming and bandwidth. For example, on a Saturday afternoon in October **240**, the major menu for sports may include a separate subcategory for college football. This subcategory would, in turn, have a separate submenu with a listing of four, six, eight, or more college football games available for viewing. In order to accommodate this dynamic menu change, the Operations Center **202** must add a submenu listing to the major sports menu, create a new or temporary submenu for college football, and allocate the necessary menu space on the college football submenu.

[**0162**] Once the television programs have been packaged and a program control information signal is generated to describe the various categories and programs available, the packaged programs are then digitized, compressed, and combined with the program control information signal. Upon the signal's departure from the Operations Center **202** the breakdown into categories is insignificant and the signal is treated like any other digitally compressed signal.

[**0163**] **FIG. 4***a* shows the basic operations that must occur in order for the packaged signal to be sent to the satellite **206**. External digital and analog signals must be received from television programming sources and converted to a standard digital format **242**, defined above for the computer assisted packaging equipment (CAP) **246**. Also within the Operations Center **202**, stored programs **244** must be accessed using banks of looping tape machines or other video storage/retrieval devices, either analog or digital, and converted to a standard digital format **242** prior to use by the CAP **246**.

[**0164**] The programmer/packager utilizing the CAP **246** must input a variety of information in order to allow the CAP **246** to perform its function of generating program control information and packaging programs. Some of the information required by the CAP **246** are the date, time slots and program categories desired by the television programmer.

[**0165**] The CAP **246** system includes one or more CPUs and one or more programmer/packager consoles. In the preferred embodiment, each packager console includes one or more CRT screens, a keyboard, a mouse (or cursor movement), and standard video editing equipment. In large Operations Centers **202***s* multiple packager consoles may be needed for the CAP **246**.

[**0166**] As shown in **FIG. 4***b*, the first step in the operation of the CAP **246** is selecting the type of programming **248** which will be packaged. Basically there are 6 broad categories in which most television programming can be classified: static programming **250**, interactive services **252**, pay per view **254**, live sports specials **256**, mini pays **258**, and data services. Static programs are programs which will show repetitively over a period of time such as a day or week. Static programs include movies showing repetitively on movie channels, children's programs, documentaries, news, entertainment.

[**0167**] Interactive services includes interactive programs using the Vertical Blanking Interval (VBI) or other data streams synchronized with the programming to communicate interactive features (such as those used in education), and games. Pay per view are programs which are individually ordered by the subscriber. After ordering, the subscriber is authorized to access the program for a limited time, (e.g. three hours, two days, etc.). Live sports specials are live events usually related to sports which subscribers are unlikely to watch on taped delay.

[**0168**] Mini pays are channels to which each set top box may subscribe. The subscriptions for mini pays **258** may be daily, weekly, or monthly. An example would be the Science Fiction channel. Data services are services in which information is interactively presented to the subscriber using a modem or other high rate of speed data transfer. Some examples are Prodigy, services for airline reservations, and TV guide services (e.g. TV Guide X*PRESS™, InSight™, etc.). Data could also include classified or other forms of advertising.

[0169] After selecting the type of programming, the packager must identify a pool of programs (within the category) to be packaged. The next CAP **246** step varies for different program categories. For the category of live sports, additional program interstitial elements **262** may be added such as promos and other sports news before further processing. For the live sports, static, interactive services **252** and pay per view **254** categories the following CAP **246** step is for one television program to be selected **264**. This is followed by each program individually being assigned dates to be played or a start date (for continuous play) and start times **266**. Many dates and start times may be assigned to any given program. The program information for these categories may then be processed for allocation of transponder space and setting of prices.

[0170] Mini pays and data services require less processing by the CAP **246**. After identifying the mini pays **258**, the CAP **246** may proceed to allocation of transponder space and pricing for the mini pays **258**. Data services in the preferred embodiment generally do not require allocation of transponder space and generally do not require price setting. The information for data services **260** may be directly processed for menu configuration. In alternate embodiments the data services **260** may be processed through these portions of the CAP **246** program.

[0171] The CAP **246** then uses an interactive algorithm to allocate transponder space **268** and set prices **270**. The factors weighed by the algorithm are: 1. buy rates of the program, 2. margin of profit on the program, 3. length of the program, 4. any contractual requirement which overrides other factors (such as requirement to run a specific football game live in its entirety). The information on buy rates of the program may be obtained from the Central Statistical and Billing Site or a Regional Statistical and Billing Site as will be described later. The CAP **246** must consider the priority levels of programming when allocating transponder space. Particularly, as in the preferred embodiment, transponders are assigned to three specific priority levels.

[0172] Following transponder allocation and price setting, the CAP **246** proceeds to menu configuration **272**. The positioning of programs within the menu configuration **272** can have an effect on subscriber buy rates for the program. Therefore, an algorithm accounting for either a manually assigned program importance, or a calculated weight of the program importance, is used to determine each programs position within the menu scheme. For instance, a popular program with a high profit margin may be assigned a high weight of importance and shown in a prominent place in the menu scheme. Alternatively, a high profit program with sagging sales may be manually assigned a prominent place in the program schedule to increase sales.

[0173] After a series of entries by the programmer/packager at the Operations Center **202**, the CAP **246** displays draft menus or schedules (including priority levels) for programming. The packager may now manipulate the menus and schedules and make changes as he feels necessary. After each change, the packager may again display the menus or schedules and determine if any more changes are necessary. When the packager is satisfied with the menu configuration **272** and scheduling of television programs, he may then instruct the CAP **246** to complete the process.

[0174] After menu configuration **272**, the CAP **246** may begin the process of generating a program control information signal **274**. In order to generate program control information signals which are specific to a particular cable headend **208** system, the CAP **246** incorporates cable franchise configuration information **276**. In the preferred embodiment, basic cable franchise configuration information **276** is stored at the Operations Center **202**. The cable franchises upload changes to their specific franchise information from time to time to the Operations Center **202** for storage. Preferably a separate CPU handles the management of the cable franchise information. From the stored cable franchise information, the CAP **246** generates a cable franchise control information signal which is unique to each franchise.

[0175] Using the unique cable franchise control information signals **278** and the menu configuration **272** information, the CAP **246** generates the program control information signal **274**. The program control information that is unique to a particular cable franchise may be identified in various ways such as with a header. With the header identification, the cable headend **208** may extract the portions of the program control information signal which it needs. Now, the CAP **246** may complete its process by electronically packaging the programs into groupings **280** for the signal transmission and adding the program control information to the packaged programs **282** to form a single signal for transmission. Through manual entries by the packager or by comparing against a list of programs, the CAP **246** will determine whether the programs are arriving from external sources **204** or sources internal to the Operations Center **202**.

[0176] Upon completion of the CAP's functions, the Operations Center **202** or the uplink site compresses **284**, multiplexes **286**, amplifies **288** and modulates **290** the signal for satellite transmission **292**. In a basic embodiment, the CAP **246** will also allow entry of time slots for local avails where no national programming will occur.

[0177] **FIG. 5** is a more detailed flow chart of some of the functions performed by the CAP **246** after an initial program schedule has been entered and menu configurations generated. The flow chart **300** shows six basic functions that are performed by the CAP **246**: (1) editing program schedule for local availability **304** (only for non-standard services, i.e. those services that are not national cable services); (2) generating program control information signals **307**; (3) processing external programs **310**; (4) processing internal programs **320**; (5) processing live feeds **330**; and, (6) packaging of program information **340**. In an alternate embodiment, the CAP **246** is capable of incorporating local programs and accommodating local availability for local television stations.

[0178] Following completion of the programming scheduling (accounting for local availability if necessary) and menu generation **304**, the CAP **246** may perform three tasks simultaneously, generating program information signals **307**, processing external programs **310** and processing internal programs **320**.

[0179] The CAP **246** automatically identifies external programs needed **312** and identifies which external feed to request the external program **314**. The CAP **246** gathers and receives the external programming information and converts it to a standard digital format **316** for use. The CAP **246** also identifies internal programs **322**, accesses the internal programs **324**, and converts them to a standard digital format if

necessary **326**. In addition, the CAP **246** identifies live signal feeds **333** that will be necessary to complete the packaged programming signal **336**. In its final task, the CAP **246** completes the packaging of the programs, combines the packaged program signal with the program control information signal, amplifies the signal and sends it out for further processing prior to uplink.

[**0180**] In the preferred embodiment, the Operations Center **202** and uplink or master control site are collocated. However, the Operations Center **202** and uplink site may be located in different geographical places. Also, functions and equipment within the Operations Center **202** may be remotely located. For instance, the program storage may be at a different site and the programs may be sent to the CAP **246** via landline.

[**0181**] In alternate embodiments using multiple Operations Centers, it is preferred that one Operation Center be designated the Master Operations Center and all other Operations Centers be Slave Operations Centers. The Master Operations Center performs the functions of managing and coordinating the Slave Operations Centers. Depending on the method in which the Slave Operations Centers share functions, the Master Operations Center coordination function may involve synchronization of simultaneous transmissions from multiple Slave Operations Centers. To perform its functions, the Master Operations Center may include a system dock for synchronization.

[**0182**] An efficient method of dividing tasks among Operations Centers is to assign specific satellite transponders to each Operations Center **202** and to assign external program sources **204** to the nearest Operations Center. Of course this division of resources may not always be possible. Since programming will be grouped into priority levels with each priority level likely to be assigned specific satellite transponders, it is also possible to assign each Operations Center to a priority level. For example, in a three priority level system with two Slave Operations Centers and 18 transponders, the Master Operations Center may be assigned priority level 1 and assigned 9 transponders. Slave Operations Center A may be assigned priority level 2 and 5 transponders, while Slave Operations Center B is assigned priority level 3 and 4 transponders. In a multiple Operations Center configuration dynamic bandwidth allocation and dynamic menu capacity allocation become more complex and must be coordinated by the Master Operations Center.

[**0183**] Similar to multiple Operations Centers, a delivery system may have multiple satellite uplinks. Preferably each Operations Center has one or more uplink sites. Each Operations Center controls the functions of its assigned uplink sites and may assign one site as a master uplink site.

[**0184**] The program control information signal generated by the Operations Center provides data on the scheduling and description of programs to the network controller **214** or in an alternate configuration directly to the set top terminal **220** for display to the subscriber. In the preferred embodiment, the program control information signal is stored and modified by the network controller **214** and sent to the set top terminal **220** in the form of a set top terminal control information stream (STTCIS). This configuration is required to accommodate differences in individual cable systems and possible differences in set top terminal devices. The set top terminal **220** integrates either the program control signal or the set top terminal control information stream together with data stored in the memory of the set top terminal **220**, to generate on-screen displays for assisting the subscriber in choosing the programs he wishes to view. (Throughout the description the term "program control information" is being used to indicate control information coming from the cable headend **208** to the set top terminal **220**, whether it is sent directly from the Operations Center, processed by the Network controller **214** and then forwarded to the set top box (STTCIS), or transmitted over telephone lines.)

[**0185**] The types of information that can be sent via the program control signal include: number of program categories, names of program categories, what channels are assigned to a specific category (such as specialty channels), names of channels, names of programs on each channel, program start times, length of programs, description of programs, menu assignment for each program, pricing, whether there is a sample video clip for advertisement for the program, and any other program, menu or product information.

[**0186**] The goal of the menu driven program selection system is to allow the subscriber to choose a program by touring through a series of menus utilizing a remote control for cursor movement. The final choice in the series of menus will identify one particular channel and one time for activation of that channel. Armed with a channel and activation time the set top terminal **220** can display the selected program on the television for the viewer. To achieve this goal a simple embodiment assigns an intelligent alpha-numeric code to each program. This alpha-numeric code identifies the category of the program, the menu in which the program should be displayed, its transmission time(s), and the position on the menu that the program should be displayed.

[**0187**] In this simple embodiment, the program; control information, including these menu codes, is sent continuously from the Operations Center to the network controller **214**, and ultimately to the set top terminal **220**. For example, four hours worth of programming information can be sent via the program control information signal continuously in the format shown in **FIG. 6**.

[**0188**] **FIG. 6** shows the basic information that is needed by the set top terminal **220**. The program descriptions shown are coded abbreviations. For example, C for comedy, N for news, S for sports, A for cartoons, and TX for text. If there is a textual description for a program, such as a movie, the description may be given following that program's coded description or may be communicated following the four hours' worth of programming information. As is shown in the coded listing, program descriptions for programs greater than a half hour in length need not be repeated (each half hour). The video description code informs the set top terminal **220** of whether there is still or live video available to advertise the program.

[**0189**] For example, a sporting program may be assigned a code of B35-010194-1600-3.25-Michigan St. vs. USC. The letter B would assign the program to category B, sports. The second alpha-numeric character number 3 would assign the program to the third menu of the sports category. The third character of the code, number 5, assigns the program to the fifth program slot on the third menu. The next six characters, Jan. 1, 1994, represent the date. The following

four characters, 1600 represent the start time which is followed by the length of the program and the program name. This entry represents a sports show, a college football game, which will be aired at 4:00 PM on New Years day 1994.

[0190] In the 12:30 Channel 1 entry of **FIG. 6**, two menu codes are shown. By allowing two menu codes, programs that may fit under two different category descriptions may be shown in both menus to the subscriber. With this minimal amount of information being communicated to the set top terminal **220** on a regular basis, the terminal is able to determine the proper menu location for each program and the proper time and channel to activate for the subscriber after his menu selection.

[0191] The program control information signal and STTCIS can be formatted in a variety of ways and the on-screen menus can be produced in many different ways. For instance, if the program control information signal carries no menu format information, the menu format for creating the menus can be fixed in ROM at the set-top terminal. This method allows the program control signal to carry less information but has the least flexibility since the menu formats can not be changed without physically swapping the ROM holding the menu format information. In the preferred embodiment, the menu format information is stored at the set top terminal **220** in temporary memory either in a RAM or EPROM. This configuration provides the desired flexibility in the menu format while still limiting the amount of information needed to be communicated via the program control information signal. New menu format information would be sent via the program control information signal or the STTCIS to the set top terminals each time there was a change to a menu.

[0192] In the simplest embodiment, the menus remain fixed and only the text changes. Thus, the program control information signal can be limited to primarily text and a text generator can be employed in the set top terminal **220**. This simple embodiment keeps the cost of the set top terminal **220** low and limits the bandwidth necessary for the program control information. Another simple embodiment uses a separate channel full-time (large bandwidth) just for the menu information.

[0193] As will be described later, live video signals may be used in windows of certain menus. These video signals can be sent via the program control information signal, STTCIS, or can be taken off channels being transmitted simultaneously with the menu display. If the video signal is taken off a channel, less information needs to be sent via the program control information signal. However, this technique requires that separate decompression hardware be used for the program control information and the channel carrying the video. Separate decompressors for the video signals and program information signal allows for the greatest flexibility in the system and is therefore the preferred embodiment. A separate decompressor also assists in assuring that the switch from menus to television programming is smooth and without any significant time delay.

[0194] Live video for menus, promos or demos may be sent to the set top terminal **220** in several ways: a) on a dedicated channel, b) on a regular program channel and scaled to size, c) sent along with the program control information signal, etc. However, in the preferred embodiment, a great deal of short promos or demo video are sent using a split screen technique on a dedicated channel.

[0195] Using a split screen technique, any number of different video clips may be sent (e.g. 2,4,6,8). To show the video dip on a menu, the video must either be scaled and redirected to a video window on a menu screen or a masking methodology can be used. Masking involves playing the entire channel of video (all 2,4,6, or 8 split screens) in background and masking the unwanted video clip portions of the split screen by playing the menu in foreground and overlaying the unwanted background video. Masking is the least expensive method because it does not require any special hardware and it increases video throughput to the set top terminal **220**. However, using the masking technique without any video redirecting causes each video clip to be located in a different position on the screen. It also requires the masking to be different for each video clip and makes consistent format difficult. Scaling and redirecting video is generally difficult, expensive and requires additional hardware.

[0196] In order to limit the amount of bandwidth needed to transmit the program control information signal, various compression techniques employed for non-video may be used such as block coding, contour coding, blob encoding, and run-length encoding. Further, the program control information signal may be divided into text and graphics, or video, text and graphics and then recombined at the set top terminal **220** using a text generator, graphics decompression, and video decompression as necessary.

[0197] **FIG. 7***a* shows a basic block diagram of a digital compression set top terminal **220**. In some respects, the set top terminal **220** is similar to other converter boxes currently available and can include a variety of error detection, decryption **600** and coding techniques such as anti-taping encoding. The set-top terminal must also have a tuner **603**, digital demodulator **606**, and demultiplexers **609**, **616** as well as audio equipment **612**, **614**. Also shown in **FIG. 7***a* is a remote control interface **626** for receiving and processing signals from remote control unit **900**. A modem **627** is provided for allowing communication between a microprocessor **602** and the cable head end. NTSC encoder **625** provides an NTSC video output to be output as a standard television signal.

[0198] The microprocessor **602** is capable of executing program instructions stored in memory. These instructions allow a user to access various menus by making selections on the remote control **900**. The various program instructions for accessing menus and performing other functions are described below.

[0199] The manner in which the video is decompressed and the menus are generated from the program control signal or STTCIS varies depending on the specific embodiment of the invention. However, at a minimum, one video decompressor capable of decompressing one video signal must be used. Basic menu format information may be stored in a graphics memory comprising ROM, non-volatile RAM, EPROM, and/or EEPROM **620**. Video decompressors **618** and **622** may be used if the video is compressed, and additional equipment to generate menus may be included. In one embodiment, a separate decompressor **622** is used to process the program control information signal and a video combiner **624** incorporates video and menu graphic infor-

mation. In the preferred embodiment, the program signal is sent with three primary parts, compressed video (or video location information), compressed graphics, and text. After the program signal is demultiplexed into its component parts, a video decompressor, a graphic decompressor, a text generator and a combiner are used to assist in creating the menus.

[0200] **FIG. 7***b* shows a basic block diagram of an alternative digital compression set top terminal **220**. The same components shown in **FIG. 7***a* are repeated in **FIG. 7***b*, and given the same reference number (e.g., tuner **603**, modem **617**, NTSC encoder **625**, etc.). **FIG. 7***b* also shows the addition of a smart card interface **617** to allow additional features to be included on a smart card insertable into the smart card interface **617**. Error correction circuitry **607** is also shown receiving the demodulated signal, prior to demultiplexing the signal. Memory associated with the microprocessor **602**, the demultiplexer **609**, the decryptor **600**, and the video decompressor **618** is shown in **FIG. 7***b*.

[0201] Box **700** in **FIG. 7***b* shows the elements of an upgrade module which is described below with respect to **FIGS. 9***a* and **9***b*. The remaining circuitry in **FIG. 7***b* shows a basic decompression box **720**, also described below.

[0202] The circuitry in box **700** includes a video, graphics and text demultiplexer **616**, a text and graphics video plane combiner **624**, a graphic decompressor **622** and a graphics memory **620**. Graphics in memory **620** is preferably run-length compressed, however other methods of compressing graphics may be used as is known by those skilled in the art.

[0203] The generated menus and video are combined in the combiner **624** and output to an anti-taping encoder **619**. Any method of anti-tapping encoding known by those skilled in the art may be used with the present invention.

[0204] **FIGS. 8***a* and **8***b* show front and back views respectively for the preferred embodiment of the set top terminal **220**. The front panel of the set top terminal **220** as shown in **FIG. 8***a* includes an infrared sensor **630** and a series of LED displays **640**. These LED displays **640** preferably indicate with an icon or a letter (e.g. A-K) the major menu currently selected by the set top terminal **220**. This visual display will remain lit while the subscriber is watching (or listening to) programming within a major menu. The LEDs **640** of the preferred embodiment also show the channels selected directly by a user, or menu channel selections which range from 1 to 50.

[0205] LEDs **640** are preferably provided to indicate a decompression error, a processing error, or other error. Text messages may alternatively be provided to more dearly indicate particular errors to servicemen or subscribers. These error indications aid in repairing or correcting any such errors in the set top terminal **220** or assist in programming the set top terminal **220**. Further displays may include current channel, time, volume level, sleep time, parental lock (security), account balance, use of a hardware upgrade, second channel being recorded by VCR, use of the Level D music hardware upgrade in a separate room, and any other displays useful to a subscriber to indicate the current status of the set top terminal **220**.

[0206] The LED's **640** may also provide an indication of the digital audio channel currently tuned. With this display feature, subscribers may use the digital audio feature without activating the television screen. The source of a signal and output selected (e.g., a subscriber's separate audio system, a VCR, etc.) may be displayed. Although LED's are preferred, the set top terminal **220** may also use a CRT, LCD's, or other display technology.

[0207] On the right front half of the set top terminal **220** there is a flapped opening **635** into a cavity that allows the insertion of a magnetic cartridge (or similar portable storage device, including optical disk, ROM, EPROM, etc.). This cartridge opening **635** allows the set top terminal **220** to be upgraded or reprogrammed locally with the use of a magnetic tape cartridge. Game cartridges may also be accepted through a similar flapped opening allowing the subscriber to play video games using the set top terminal **220**.

[0208] On the top or cover of the set top terminal **220** are located pushbutton controls **645**. In the preferred embodiment these pushbutton controls **645** duplicate the two-part alpha-iconic remote control that will be described later. Any function that can be performed on the remote may also be performed at the set top terminal **220** using the duplicative pushbutton controls **645**.

[0209] **FIG. 8***b* provides a rear view of one embodiment of the set top terminal **220** including the input/output equipment of the terminal. Moving from left to right there are a pair of output terminals **650**, a pair of input terminals **652**, a pair of stereo/audio output terminals **654**, a satellite dish input port **656**, a telephone jack **658** and an RS422 port **660**. Further to the right there is an upgrade port **662** and a cover plate **664** held in place by a series of sheet metal screws.

[0210] The set top terminal **220** has two outputs **650**, one for a television and one for a VCR. Control signals may be transmitted through the VCR output to allow the VCR to be automatically controlled by the set top terminal **220**. Certain program may be selected by a subscriber from menus, and the VCR will be automatically activated to record the selected program.

[0211] The set top terminal **220** is equipped to handle one or two cable inputs by way of inputs **652** for incoming signals. In addition, a phone jack **658** and RS242 or 422 port **660** are provided for maintenance, trouble shooting, reprogramming and additional customer features. In alternate embodiments, the telephone jack **658** may be used as the primary mode of communication between the cable headend **208** and the set top terminal **220**. This connection is possible through the local telephone companies, cellular telephone companies or personal communications networks (PCN).

[0212] In an alternative configuration, in areas without cable services where subscribers use backyard satellite systems (TV RO) to receive packaged television services, the set top terminal **220** will include the appropriate hardware to allow connection to the satellite **206** reception equipment through port **656**. In this configuration, the menu system within the set top terminal **220** will be programmed directly from the operations center. Additionally, an upstream communication mechanism must be in place at the subscriber's home (i.e. modem) to communicate information to the operations center.

[0213] In order to provide the greatest flexibility possible and prevent the set top terminal **220** from becoming outdated during the terminal's useful life, an additional electronic card slot or expansion slot has been built into the

preferred embodiment. This expansion slot is covered by the metal plate cover **664** shown in **FIG. 8***b*. It is anticipated that additional memory or capabilities may be needed for certain customer features and also to update the system as the cable delivery system's capabilities increase. The expansion slot provides an easy method to upgrade the terminal hardware.

[**0214**] In the preferred embodiment, the set top terminal **220** includes a hardware upgrade port **662** as shown in **FIG. 8***b*, in addition to the expansion slots behind plate **664**. The hardware upgrade port **662** should accommodate at least a four-wire connection for: (1) error corrected, decrypted data output of the set top terminal **220**, (2) control interface, (3) decompressed video output of set top terminal **220**, and (4) video input port. In the preferred embodiment multiple wires are used to perform each of the four functions. The four sets of wires are combined in a single cable with a single multipin connector. Port **662** may also be used to attach various hardware upgrades below to a set top terminal **220**.

[**0215**] In the preferred embodiment, multipin connections may be used for the multiwire cable. The multipin connection **662** may range from DB9 to DB25. A SCSI, or small computer systems interface, port may also be provided. Alternatively, four or more ports may be provided instead of the single port depicted.

[**0216**] The preferred embodiment has four hardware upgrades available for a set top terminal **220**: a Level B interactive unit, a Level C interactive unit with compact disc capability, a Level D digital radio tuner for separate room use, and a Level E information download unit. Each of these upgrades is connected to the set top terminal **220** unit via the same upgrade port **662** described earlier. The same four wires in a single cable described earlier may be used.

[**0217**] The Level B interactive unit will allow the user access to online data base services for applications such as home shopping, airline reservations, news, financial services, classified advertising, home banking, and interactive teletext services. For example, with this upgrade, a user will be able to reserve plane tickets or buy consumer electronics. The primary feature of this upgrade unit is that it allows actual transactions to occur requiring two way communications via modem with outside services. This added two way communications capability may be with the cable headend **208**. Additionally, this two way communications may occur over cellular or PCN.

[**0218**] The Level C interactive unit will employ a high volume local storage capacity, including compact disc or other random access digital data formats. This unit will allow use of interactive multi-media applications. For example, computer games, multi-media educational software, encyclopedias, other reference volumes (e.g. Shakespeare library), etc. In the preferred embodiment, many of these applications will interact with live programming providing additional information and interactivity to the basic program feed. For example, a viewer watching a show set in a foreign country may be able to retrieve additional information, maps, economic data, etc. about that country that are stored on the compact disc. In the level C applications, the upgrade hardware may closely monitor the television broadcast via additional data channels (e.g. vertical blanking interval, or other digital data encoded within live video) providing context sensitive interactivity.

[**0219**] The Level D hardware upgrade, digital radio tuner, will allow the subscriber separate access to the digital radio channels while other programming (not necessarily radio) is being viewed on the television. Typically this upgrade would be used for digital radio usage in a separate room from that of the television. The upgrade has a separate tuner, decompressor, and visual display. In the preferred embodiment a second remote control (scaled down version) is provided to access the audio system.

[**0220**] The Level E hardware upgrade allows the subscriber to download large volumes of information from the operations center or cable headend **208**. The Level E hardware upgrade will enable subscribers to download data such as books to local storage. Primarily the Level E hardware upgrade is additional local storage via hard disk, floppy, optical disk, magnetic cartridge etc. Preferably a small portable reader called "EveryBook™" is also provided with the upgrade to enable downloaded text to be read without the use of a TV.

[**0221**] The downloadable information may be text or video supplied by the operations center or cable headend **208**. With this upgrade, books may be downloaded and read anywhere with the portable reader. Using this upgrade video may be downloaded and stored in compressed form for later decompression. The video would be decompressed only at the time of viewing. Important text that the public desires immediate access may made available through this system. Text such as the President's speech, a new law, or a recent abortion decision rendered by the Supreme Court may be made immediately available.

[**0222**] Using a more sophisticated port, especially the SCSI port, multiple hardware upgrade units may be connected, or "daisy-chained" together, to operate simultaneously.

[**0223**] **FIG. 9***a* shows sets of wires in a single cable connecting an upgrade module **700** and the simple decompression box **720** through a port similar to the hardware upgrade port **662**. The simple decompression box **720** preferably is an industry standard decompression box capable of communicating with an upgrade module to enhance functionality. For example, a microprocessor in the simple decompression box **720** will be able to communicate with a microprocessor in an upgrade module **700**.

[**0224**] Thus, as shown in **FIG. 9***a*, if this type of connection is built into a simple decompression box that does not have the full functionality of the set top terminal **220**, an upgrade module unit **700** may be connected providing the simple decompression box **720** with the full functionality of a set top terminal **220**. Subscribers who have purchased simple decompression boxes **720** may be given all the functions of a set top terminal **220** inexpensively.

[**0225**] In the preferred embodiment, multipin connections may be used for a multiwire cable connecting decompression box **720** with the upgrade module **700**. The multipin connection may range from DB9 to DB25. A SCSI, or small computer systems interface, port may also be provided. Alternatively, four or more ports may be provided instead of the single port depicted.

[**0226**] The digital data set of output wires of the simple decompression box **720** will preferably output error corrected and decrypted data to the upgrade set top terminal **700**. The second set of wires, the interface connection, allows the microprocessor in the upgrade module **700** to

communicate to the microprocessor of the simple decompression box **720**. In this manner, the video circuitry of the upgrade module **700** and the simple decompression box **720** may be synchronized. The third set of wires, the decompressed video output, can provide the upgrade module **700** with a decompressed video signal to manipulate. The fourth set of wires, video input set, allows the simple decompression box **720** to accept a video signal that is a combined text, graphics, and video signal.

[**0227**] Upgrade module **700** preferably includes at least the following circuitry: a video, graphics and text demultiplexer; a text and graphics video plane combiner; a run-length graphics decompressor; and, a run-length compressed graphics memory (non- volatile RAM, ROM, EPROM, or EEPROM). By means of communications through the multi wire connection between upgrade modules **700** and simple decompression box **720**, compressed video and control signals may be demultiplexed by the demultiplexer within upgrade module **700**. The run-length graphics decompressor, by communicating with the run-length compressed graphics RAM, permits decompression of the input compressed video signal. The text and graphics video plane combiner in upgrade module **700** allows the demultiplexed and decompressed signal to be output, through simple decompression box **720**, to a subscriber's television with both video and overlay menus with text.

[**0228**] **FIG. 9***a* shows the CATV input **722**, the video input **724**, and the video and audio outputs **726**, **728**, as part of simple decompression box **720**. This is the preferred embodiment because this will reduce the component cost of upgrade module **700**. Upgrade module **700** could simply be a cartridge insertable into simple decompression box **720**. Alternatively, as shown in **FIG. 9***b*, the CATV input **722**, the video input **724** and the video and audio outputs **726**, **728** may be included as part of upgrade module **700**.

[**0229**] The electronics of the set top terminal **220** must receive signals from the Cable headend **208** or Operations Center and separate the program control information from the packaged programs. After separation of the program control information, this signal may be used to generate program menus allowing the user to select specific television programs from within the packaged programs. After selection of a particular program, the set top terminal **220** will demultiplex and extract a single channel signal then decompress the appropriate channel signal to allow the user to watch his selected program. Although the set top terminal **220** can be equipped to decompress all the program signals, this adds unnecessary cost since the subscriber will view one channel at a time. Upon the occurrence of an error in this selection and decompression procedure, the set top terminal **220** LED display will warn the subscriber of an error.

[**0230**] During the normal functioning of the set top terminal **220** the LED display can be customized by the user to display the time, the program channel, VCR activation or other pertinent information. Although the set top terminals may be operated using the keyboards located on top of the set top terminal **220** box, it is expected that most subscribers will use the remote control.

[**0231**] Although the preferred embodiment decompresses one channel at a time for the viewer, users who desire to use the picture-on-picture capability of their televisions can be provided with an upgrade to the set top terminal **220** allowing two channels to be tuned and decompressed at any given time. Once two signals are available to the television the picture-on-picture capability may be utilized to its fullest potential. With the picture-on-picture capability available in the set top terminal **220**, a special television is not required for picture-on-picture functionality.

[**0232**] In the preferred embodiment all of the customer features available on the set top terminal **220** will be controllable via on-screen menu displays. In this manner, the subscriber using a cursor may easily customize the programming of his set top terminal **220**. The basic programming of each set top terminal **220** will be located on ROM within the set top terminal **220**. Random access memory, the magnetic cartridge capability, and the extension card slot will each allow upgrades and changes to be easily made to the set top terminal **220**.

[**0233**] In the preferred embodiment, the set top terminal **220** will include features that are now being adopted in the industry such as parental controls and locks, electronic diagnostics and error detection, mute, on-screen volume control, sleep timer, recall of last selection, etc. Each of these features has a corresponding menu that allows on-screen customizing and activation of the feature. The set top terminal **220** also includes a sophisticated favorite channel list and favorite program list.

[**0234**] In addition to all the features that the set top terminals supports with its current internal programming, additional features may be added or existing features upgraded through remote reprogramming of the set top terminal **220**. Utilizing the resident operating system on the ROM, the cable head end is able to reprogram the random access memory of the set top terminal **220**. With this capability the cable head end can remotely upgrade software on the set top terminals.

[**0235**] In the preferred embodiment, the cable head end will reprogram the menu format from time to time based upon special events or programming needs, such as Olympic telecasts, presidential elections, etc. This reprogramming will occur by using the program control information channel and sending the appropriate signals over this channel. In an alternative embodiment, one channel is dedicated for the special programming needs. When reprogramming is to occur, the cable head end will send an interruption sequence on the program control information channel that informs the set top terminal **220** that reprogramming information is to follow. Significant reprogramming of the set top terminals will occur infrequently. However, the changing of color or formats on menus occur more often. In alternative embodiments, color changes to menus may be accomplished via the program control information itself and does not require reprogramming from the cable head end.

[**0236**] In the preferred embodiment, the basic building blocks or templates of the on-screen menu displays will be stored on graphics memory consisting of no-volatile RAM, ROM, EPROM, or preferably, EEPROM, as shown as **620** in **FIG. 10**. With the information from this graphics memory **620**, the microprocessor **602**, graphics decompressor **622**, text generator **621** (if necessary), and video combiner **624** will build a menu screen. The memory files of the graphics memory or EEPROM **620** are preferably categorized into three categories, background graphics **800**, logo graphics **820**, and menu and display graphics **850**.

[0237] A background graphics file **800** will store menu backgrounds such as: universal main menu backgrounds **804**, universal submenu backgrounds **808**, promo backgrounds **812** and custom menu formats **816**. A logo graphics file **820** will store any necessary logos such as: Your Choice TV logos **824**, Network logo files **828**, cable system logo files **832**, studio logo files **836**, and graphic elements file **840**. A menu display and cursor graphics file **850** will store menu display blocks **854** and cursor highlight overlays **858** as well as any other miscellaneous files needed to build the menus.

[0238] Using this method of storing menus, the menus can be changed by reprogramming the graphics memory **620** of the set top terminal **220**. To revise the entire design of displayed menus, the network controller **214** or operations center instructs the EEPROM **620** to be erased and reprogrammed with new menu templates. To change one menu format or logo, the network controller **214** or operations center instructs just the one location in memory to be erased and rewritten. Obviously, this menu reprogramming can be done locally (at the set top terminal **220**) by a servicemen.

[0239] As shown in **FIG. 10***a*, each memory subfile is further divided into various memory blocks. For example, the background graphics file **800** contains the universal main menu backgrounds **804**. The universal main menu backgrounds memory **804** includes memory units UM1, UM2 and UM3, as shown in **FIG. 10***a*. Similarly, the logo graphics file **820** and menu display and curser graphics file **850** further contain within those subfile individual memory blocks (for example, studio logo file **836** has memory block SL1; menu display blocks **854** has memory menu display block MD1).

[0240] **FIG. 10***b* shows the hierarchical storage of text transmitted from the cable head end as STTSCIS. Although text may be continuously transmitted with the video signals to set top terminals **220**, text may also be transmitted intermittently. In such a case, the text is stored in the set top terminal. Preferably, the text is transmitted and stored in a compressed format using known techniques. Additionally, the text is preferably stored in graphic memory **620** within set top terminal **220**.

[0241] Depending upon the use of the text, it will be stored in one of three portions of memory. Information sent with the text will either direct the text to a particular portion of memory, or include information as to the priority of text. The microprocessor **602** may then direct the text to the appropriate memory location for storage.

[0242] If the text is to be used frequently and over a long period of time, a long term storage **875** will be used. If the text will be used for a shorter period of time (for example, a month), the text will be directed to an intermediate storage area **877**. If the text is to be used almost immediately, or for a short period of time (for example, within a few days) the text is directed to a short term storage area **879**. Microprocessor **602** locates the appropriate text required for a particular menu and retrieves it from the appropriate portion of memory **620**. The text is output from the graphics memory **620** to the text generator **621**. Text generated from the text generator **621** is thereafter directed to text/graphics combiner **624**.

[0243] **FIG. 10***c* shows the steps performed by the microprocessor **602** for creating a menu based upon a series of overlay screens. These instructions are stored in memory within the set top terminal **220**. Alternatively, these instructions or routines are transmitted from the operations center **202** to be stored in memory within the individual set top terminals **220**.

[0244] Initially, microprocessor **602** instructs tuner **603** to select a channel. The channel is decompressed, and error corrected and decrypted, if necessary. If the video is to be reduced in size, so as to be placed within a video window **1556**, or is a split screen video window which must be enlarged, the video is scaled to the appropriate size. Additionally, the video may be required to be redirected to a portion of the television screen. This is done by creating a series of offsets for each pixel location of the video.

[0245] Graphics must also be used to create a menu in most instances. As is shown in block **882**, the microprocessor **602** must fetch a background file, fetch a logo file and fetch a menu display and cursor file in most instances. Each of these files must be decompressed. Following decompression, the file is sent to video combiner **886**.

[0246] Similarly, microprocessor **602** must fetch text, as shown in block **884**. Depending upon the memory location of the text, microprocessor **602** will fetch the text for long-term, intermediate-term, or short-term storage, as described above. Based upon this memory retrieval, the text is generated and sent to video combiner **886**. Video combiner **886** combines the video (if any) with as many screens of a decompressed graphics as are necessary, and any text. The image or portions of the image are stored in combiner **886** until all overlays are received by combiner **886**. Thereafter, the entire image is sent, under direction of another routine, to be displayed on the television screen, as represented by display block **888**.

[0247] **FIG. 10***d* is a full chart of programming instructions performed by microprocessor **602** for sequencing menus. Upon powerup of the set top terminal **220**, start up routine **890** is performed. Any error checking is thereafter performed (**891**), and introductory menu subroutine **892** is performed. This subroutine displays the introductory menu and the microprocessor thereafter awaits for an input **893**.

[0248] If the subscriber inputs a channel selection **894**, video for the particular channel is decompressed **895**. Otherwise, the microprocessor performs another routine **896** to display the home menu **897**.

[0249] At the home menu portion of the sequence of routines, a subscriber may select one of the major menus, thus starting the sequence of displays represented by routine block **898**. Alternatively, a subscriber may go directly to a major menu by depressing a menu select button on remote **900** and the microprocessor will execute another the go to submenu subroutine **896**.

[0250] Once a subscriber has selected a major menu, the appropriate subroutines are executed by the microprocessor using a series of instructions shown in block **898**. After each display, microprocessor **602** awaits for a selection by the subscriber, shown as block **899**. These blocks could be also represented as decision blocks.

[0251] After displaying the major menu, and receiving a selection by the user, a particular submenu for a subcategory is displayed, if such a menu exists. Again, microprocessor

602 waits for an input from the subscriber after executing a routine to display a program listing submenu. Thereafter, after receiving an input, microprocessor **602** performs the next routine for displaying a program description submenu. Thereafter, if a particular selection requires a confirmation menu, that subroutine is executed and the appropriate menu displayed. Thereafter, the selected video is decompressed, and displayed on the television screen. If there are any display overlay menus or hidden menus, the proper subroutine is executed by microprocessor **602** and these menus are displayed.

[**0252**] At any time during the selection of menus in major menu block **898**, the subscriber may also depress another major menu button to move into a second column of process instructions (represented by major menu **2**, major menu **3**, etc. columns). Thus, a subscriber may move from major menu to major menu. Additionally, a subscriber may depress a home menu button on remote **900** to return to the home menu at any time.

[**0253**] The various subroutines executed by microprocessor **602** allow a subscriber to navigate through the various menus of the present invention. A subscriber may sequence back through menus or return to the home menu with a one-touch return of the home menu button on remote **900**. All of these functions help to add to the system's user friendliness.

[**0254**] As shown in **FIGS. 11***a* and **11***b*, a two-section remote control is shown. To reduce costs and make the set top terminal **220** as user friendly as possible, a standard television remote control **860** is augmented by adding a new section **862** that provides the additional digital menu access and ordering functions. **FIG. 11***a* depicts the addition of menu access and cursor movement control to a Gerald RC **650** Remote Control. The cursor movement and function buttons required for the set top terminal's operation may be added to any standard remote control format allowing the user to feel more at home with the new remote control. **FIG. 11***b* shows the two-section remote control combined in a single unit **864**.

[**0255**] The remote control **864** has an ordering button **866**, four-way cursor movement, and a "go" button **868**, and menu access buttons **870**. The remote operates using infrared with the signals being received by the infrared sensor on the front of the set top terminal **220**.

[**0256**] In the simplest embodiment the remote may be built with only cursor movement and a go button. In more sophisticated embodiments the remote control may be provided with buttons that are programmable to perform specific functions for a series of entries. An intelligent or smart remote would increase both the cost and capability of the set top terminal **220** system. Using this augmented remote control the subscriber can navigate the program menu system of the set top terminal **220**.

[**0257**] **FIGS. 12***a* and **12***b* show an alternative and preferred embodiment of the remote control for use in the present invention. The standard television receiver remote control switches or buttons **920** are again separated from the menu accessing ordering function buttons **950**. The standard television receiver remote control buttons **920** include volume control, channel select, power and signal source buttons. The menu buttons **950** include cursor movement and select, menu select, and pay television buttons. However, the standard buttons **920** are separated from the menu access and ordering buttons **950** in the longitudinal direction of the remote, as opposed to the width-wise separation, shown in **FIG. 11***a*. Additionally, the color of the buttons or the surrounding background may differ between the standard television remote control buttons **920** and the menu buttons **950** to visually differentiate between these two groups of buttons.

[**0258**] The width and depth of the remote control unit **900** are considerably less than the length to allow the remote control unit **900** to fit easily within a user's palm. The remote control unit **900** in preferably has the center of mass balanced substantially near the longitudinal middle. This allows a user's thumb to naturally be placed in substantially the middle portion of the remote control unit **900**, when it is picked up by a user.

[**0259**] Since the center of mass of the remote control unit **900** is placed substantially near the longitudinal middle of the remote **900**, thereby having a user's thumb naturally fall in this same center region, the standard remote **920** and menu access **950** switches or buttons most frequently accessed and depressed by a user are placed within easy reach of the user's thumb. Channel and volume increment and decrement buttons **910** are placed near this center of mass and longitudinal center line. The channel buttons **910** are preferably beveled in opposing directions to allow a user to feel for and press a desired button without looking down at remote **900**. Similarly, the volume buttons **910** are preferably beveled in opposing directions for the same reason.

[**0260**] Additionally, the channel buttons **910** could have a surface texture, different from those of the volume buttons **910** to allow even easier differentiation between channel and volume buttons **910**. For example, the volume buttons could have a rough surface texture, while the channel buttons could have a smooth surface texture.

[**0261**] Also placed in the longitudinal center, within easy reach of a user's thumb, are cursor movement buttons **970** and "go" button **975**. The "go" button **975** selects an option corresponding to the placement of the cursor. As opposed to buttons, a joystick may be used with a selection on the stick, or a trackball, depressible for selecting a desired choice. The cursor buttons **970** are placed ninety degrees apart, with the "go" button **975** placed within the center of the cursor movement buttons **970**, as shown in **FIG. 12***b*. The cursor movement buttons **970** are preferably beveled inwardly toward the "go" button **975**. The "go" button **975** is recessed below the level of the cursor movement buttons **970** so that it is not accidentally pressed while depressing the cursor movement buttons **970**. In addition to the beveling on the cursor movement buttons **970**, they may also have a surface texture to allow a user to feel for and select the appropriate button without looking down at the remote **900**. Directional arrows could be raised or recessed on the surface of the cursor movement buttons **970** for this purpose.

[**0262**] Menu select buttons **960** are placed near buttons **970** as shown in **FIG. 12***b*. Menu select buttons **960** are preferably the largest buttons on remote **900**. Menu select buttons **960** preferably have icons or other graphics imprinted on their top surface or adjacent to the corresponding button. For example, a button for the sports major menu may contain a baseball icon. The icons represent the pro-

gramming available on the particular major menu selected by the menu select buttons **960**. The icons may also be raised above the level of the menu select buttons to provide a textured surface. This would allow a user to select an appropriate menu button **960** by feel, without looking at the remote control unit **900**. The icons would require substantial differences in texture, while still providing a meaningful graphic related to the associated menu.

[**0263**] As shown in **FIGS. 12***a* and **12***b*, labels and icons are provided for the following major menus: movies, sports, children's programming, documentary/news, entertainment, magazines, programming guide, HDTV (high definition television), interactive TV, music, and an additional button for further programming. Menu select buttons **960** may also be labeled A through J for the above programs, with the last button for all additional major menus labeled K-Z.

[**0264**] The layout of the user select buttons for the remote **900** have been designed to allow a user to select an appropriate button without viewing the remote by using the layout of buttons shown in **FIGS. 12***a* and **12***b*, in conjunction with textured or beveled buttons. With this "eye-off-of-the-remote" construction, most of the frequently used buttons may be located by the sense of touch alone. However, to aid selection of an appropriate button visually, certain buttons may have different colors. For example, the menu select buttons **960** may all be of a color different from the rest of the buttons on the remote **900**. Additionally, the colors should be selected to provide for easy location and identification by a user. For example, if the icons are printed in black ink, yellow menu select buttons **960** are preferred, because yellow would provide the greatest visual contrast with the black ink.

[**0265**] Although remote **900** is described with a variety of channel selection buttons, nearly all buttons from a standard remote control (section **920** buttons) could be eliminated. The present invention would allow a subscriber to use a remote control containing only menu select buttons and/or cursor movement and select buttons.

[**0266**] The power button **924** and "go" button **975** preferably have a separate color from the other buttons on the remote **900**. The power button **924** is preferably a separate color because this button is used infrequently. The power button is placed out of a user's thumb's reach so it is not accidentally depressed. The power button **924** should be distinguished from the other buttons because a television viewer must locate this button first before viewing any programming. Similarly, the "go" button **975** is used often because it provides the means for a user to select options, and thus should be easily distinguished from the other buttons.

[**0267**] Pay television buttons **980** may also be assigned a color different from the other buttons on the remote **900**. By making the pay television buttons **980** a different color, it would help a user to avoid selecting an undesired pay television program.

[**0268**] As used herein, "button" is contemplated to include all manner of switches or touch sensitive circuitry to activate a particular function in the remote control unit **900**. Additionally, although the remote control unit **900** communicates with the set-top box by means of infrared transmission, other forms of communication are contemplated, including ultrasound, radio frequency and other electromagnetic frequency communication.

[**0269**] **FIG. 13** shows the basic structure of the program menu system. Although the term "menus" has been used above, the menus could also be seen as defining zones or categories of programming. The first series of menus, Introductory menu **1000**, Home menu **1010**, Major Menus **1020**, and Submenus **1050** execute subscriber program selection inputs. The During program menus **1200** provide a subscriber with additional features or options after a program has been selected and shown. There are two primary types of During program menus **1200**, Hidden Menus **1380** and Program-Overlay Menus. Both are described in the following text and figures. The menu sequence and each menu structure has been particularly program designed using the "eye-off-the-remote" design concept. A subscriber can easily navigate through the menu system with the cursor movement and "go" buttons **970**, **975**. Since the subscriber never needs to take his eye off the television screen, the cable operator is likely to have the subscriber's complete attention.

[**0270**] The introductory menu screen **100**P automatically appears upon power-up and initialization of the set top terminal **220**. The introductory menu screen **1000** welcomes the user to the cable system and provides important announcements or messages. In addition, the introductory menu **1000** can be used to inform the subscriber if he has a personal or group message that has been sent to his set top terminal **220** by the cable headend. The subscriber may then access the personal or group message with an appropriate key entry while viewing the introductory menu **1000**. Since the introductory menu **1000** must be viewed by each subscriber, it also provides an opportunity for the cable provider to run advertisements.

[**0271**] Following the introductory menu screen **1000** the subscriber will normally be advanced to the home menu screen **1010**. The home menu **1010** is the basic menu that the subscriber will return to make his first level of viewing decisions. From the home menu **1010**, the subscriber is able to access all television programming options. Some programming options may be accessed through cursor movement on the screen, others directly by a button selection on the remote control **900**, or both, on-screen selection and remote control **900** direct access.

[**0272**] In the normal progression through the menu screens, the subscriber will be forwarded to a major menu screen **1020** that correlates to his direct remote control **900** selection or selection from the home menu screen **1010**. The selections on the home menu **1010** are for large categories of programming options and therefore the major menu **1020** allows the subscriber to further refine his search for the television program of his choice.

[**0273**] Following the major menu **1020** the subscriber will navigate through one or more submenu screens **1050** from which he will choose one particular program for viewing. For most programming selections the user will proceed from the home menu **1010** to a major menu **1020** and then to one or more submenus **1050**. However, for certain programming options or functions of the set top terminal **220** the user may skip one or more menus in the sequence. For example, in the preferred embodiment the subscriber may directly access a major menu **1020** by pressing a single icon button. In an alternative embodiment, the introductory menu **1000** will provide the user with the capability of directly accessing

information on his cable television account without proceeding through a series of menus.

[0274] The series of menus shown in **FIG. 13** is the normal or standard format for a variety of alternative embodiments to the present invention. An introductory screen upon power up that contains important messages, followed by a home menu **1010** with major programming categories is the basis upon which many alternative embodiments of the menu driven selection process can be built.

[0275] Skipping a sequence or level of the menu structure is possible and perhaps desired in certain instances. In simple alternate embodiments it is possible to combine the home menu **1010** and introductory menu **1000** into one menu that performs both functions. It will be obvious to one skilled in the art that the specific functions of the Home menu **1010** and Introductory menu **1000** may be exchanged or shared in a number of ways. It is also possible to allow a user to skip directly from the introductory menu **1000** to a submenu **1050**. This can be accomplished most easily with a separate direct access remote control **900** button. Generally, a subscriber will access a television program through execution of a submenu **1050**.

[0276] The During program menus **1200** are enacted by the set top terminal **220** only after the subscriber has selected a television program. These menus provide the subscriber with additional functionality and/or additional information while he is viewing a selected program. The During program menus **1200** sequence can be further subdivided into at least two types of menus, Hidden Menus **1380** and Program Overlay Menus **1390**.

[0277] To avoid disturbing a subscriber during viewing of a program, the Hidden Menus **1380** are not shown to the subscriber but instead "reside" at the set top terminal **220** microprocessor. The Hidden Menus **1380** do not effect the selected program audio. The microprocessor awaits a button entry either from the remote **900** or set top terminal **220** buttons before executing or displaying any Hidden Menu options. The Hidden Menus **1380** provide the subscriber with additional functions such as entering an interactive mode or escaping from a selected program.

[0278] Program Overlay Menus **1390** are similar to Hidden Menus **1380** in that they occur during a program. However, the Program Overlay Menus **1390** are overlayed onto portions of the television screen and not hidden. The Program Overlay Menus **1390** allow the subscriber to continue to watch the selected television program with audio but place additional information on portions of the television screen. Most overlays cover small portions of the screen allowing the subscriber to continue to comfortably view his program selection. Other Overlays which are by their nature more important than the program being viewed will overlay onto greater portions of the screen. In the preferred embodiment, some Program Overlay Menus **1390** reduce or scale down the entire programs video screen and redirect the video to a portion of the screen.

[0279] All menu entries may be made either from buttons available on the top cover of the set top terminal **220** or from the remote **900**.

[0280] **FIG. 14***a* shows the preferred embodiment for subscriber selection of television programming. **FIG. 14***b* shows additional major menu **1020** categories, **1042**, **1044**, **1046**, **1048**, which may used with the invention. Again, the introductory menu **1000** followed by the home menu **1010** is the preferred sequence of on-screen displays. In the preferred embodiment shown in **14***a*, the home menu **1010** provides a choice of ten major menus **1022**, **1024**, **1026**, **1028**, **1030**, **1032**, **1034**, **1036**, **1038**, **1040**. Upon selection of a major menu **1020** category from the home menu **1010**, the program proceeds to a major menu **1020** offering further viewer selections. Each major menu **1020** is customized to target the expected viewership. Depending on the number of available program choices the major menus **1020** either breakdown the major category into sub-categories or provide the subscriber with access to further information on a particular program.

[0281] For example, the major menu **1020** for children's programming provides a list of subcategories **1052** from which the subscriber selects. Upon selection of a subcategory a submenu **1054**, **1056** listing program choices within that sub-category is shown to the subscriber. Upon selection of a particular programming choice within the first submenu **1050**, the subscriber is then provided with a second submenu **1058** describing the program that the subscriber has selected. From this menu, the subscriber may now confirm his program choice and receive a confirmation submenu **1060** from the set top terminal **220** software.

[0282] Since the system utilizes digital signals in compressed format, High Definition Television programming can also be accommodated through the menu system. In addition, since the set top terminal **220** has two way communication with the cable headend, interactive television programming is possible, with return signals generated by the set top terminal **220**. Similarly, the system can support "movies on demand" where a subscriber communicates through the set top terminal **220** with an automated facility to order movies stored at the facility.

[0283] Using this on-screen menu approach to program selection, there is nearly an unlimited number of menus that can be shown to the subscriber. The memory capability of the set top terminal **220** and the quantity of information that is sent via the program control information signal are the only limits on the number of menus and amount of information that can be displayed to the subscriber. The approach of using a series of menus in a simple tree sequence is both easy for the subscriber to use and simply implemented by the set top terminal **220** and remote control device **900** with cursor movement. A user interface software programmer will find many obvious variations from the preferred embodiment shown.

[0284] **FIGS. 15***a* and **15***b* show examples of introductory menu screens that are displayed on the subscriber's television. **FIG. 15***a*, the preferred embodiment, welcomes the subscriber to the cable system and offers the subscriber three options. The subscriber may choose regular cable television (channels 2 through 39), programs on demand (e.g., movies), or instructions on the use of the remote control **900**. Other basic program options are possible on the introductory menu screen **1000**. For example, instead of, or in addition to, the remote control **900** instructions, a system "help" feature can be offered on the introductory menu **1000**.

[0285] **FIG. 15***b* shows an alternate embodiment for the introductory menu screen **1000**. In the upper left-hand corner of the menu, there is a small window **1002** that may

be customized to the subscriber. A subscriber will be given the option of showing the current time in this window. In the upper right-hand corner a second customized window **1004** is available in which a subscriber may show the day and date. These windows may be easily customized for subscribers to show military time, European date, phase of the moon, quote of the day, or other informational messages. These windows may be customized by subscribers using on-screen menu displays following the introductory menu **1000**.

[**0286**] In the preferred embodiment, the subscriber is given the capability of accessing base channels such as regular broadcast TV and standard cable channels directly from the introductory menu **1000** by entering the channel number. The subscriber is also given the capability of directly accessing his account with the cable company. Further, in the preferred embodiment, the subscriber may directly access a major menu **1020** and bypass the home menu screen **1010**. If the subscriber is familiar with the programming choices available on the major menus **1020**, he may select an icon button **960**, or a lettered key (alpha key) from his remote control **900** and directly access the desired major menu **1020**. If any key entry other than those expected by the set top terminal **220** software program is made, the home menu **1010** is placed on the television screen. In addition, after a period of time if no selections are made from the introductory menu **1000**, the program may default to the home menu screen **1010**.

[**0287**] **FIGS. 16***a*, **16***b*, **16***c*, and **16***d* are examples of home menus **1010** that may be used in the set top terminal **220** software. **FIGS. 16***a*-**16***d* all employ multiple window techniques to make the menu user friendly and offer a significant number of choices. It is preferred that a channel line up and the major menu **1020** categories both appear on the home menu **1010**.

[**0288**] **FIG. 16***a*, the preferred home menu **1010** embodiment, displays both the standard channel line up and the programming on demand icons for selection by the subscriber. **FIG. 16***a* also shows various levels of subscription programming, including a "Basic"cable package and a "Basic Plus" package. Each of the choices of subscription programming preferably is assigned a different color. This increases the user friendliness of the present invention.

[**0289**] In **FIGS. 16***b*-**16***d*, the left half of the screen is used to list the channel number and network abbreviation of the most popularly watched networks. The right half of the screen offers access to a variety of major menus **1020** listed by category names.

[**0290**] **FIG. 16***b* shows an embodiment in which only eight major menus **1020** are utilized. By pressing the alpha-numeric or icon key **960** corresponding to the category of programs the subscriber desires, the appropriate major menu **1020** is accessed. In addition, the subscriber may employ an on-screen cursor to select any option shown in the menu. To move the cursor, the subscriber may use either the cursor movement keys on the remote control **900** or similar keys located at the top of the set top terminal **220**.

[**0291**] **FIG. 16***c* shows how additional major menus **1020** can be displayed on the home menu screen **1010**. When there is no longer room available for additional major menu **1020** choices on the home screen, the subscriber may access a second screen of the home menu **1010**. For example, in **FIG. 16***c*, if additional major menus **1020**"T" through "Z" existed, the subscriber would access those menus by highlighting and selecting the J through Z menu option(or press the J-Z on his remote **900**). After selecting J through Z, the second or extended home menu screen **1010** would appear on a subscriber's television set. This menu would then list options J through Z separately by name. Theoretically, the home menu **1010** may have many extended home menu screens. However, any more than a few extended home menu screens would confuse the average subscriber.

[**0292**] The home menu **1010** of **FIG. 16***d* adds an additional feature at the bottom of the television screen **1011**. This option allows a subscriber to see only those program selections that are available on broadcast television. **FIGS. 16***a-d* are but a few of the numerous variations available for the home menu **1010**.

[**0293**] Additionally, as shown in **FIG. 17**, in an alternate embodiment, the home menu **1010** (or menu which would normally follow the introductory menu **1000**) can be simply the standard cable channel line-up. Offering the standard cable line-up on a separate menu may make selection easier for viewers with small television screens.

[**0294**] **FIGS. 18***a* and **18***b* are examples of major menus **1020**. In particular, **FIGS. 18***a* and **18***b* show a major menu **1040** whose category is hit movies. The hit movie category is a list of recently released movies which have been found to be popular among movie goers. This movie list is changed once or twice a week to keep in line with new movie releases. Again, multi-window and customized window techniques are utilized to make the menu as user friendly as possible.

[**0295**] **FIG. 18***a* shows the preferred embodiment of the hit movies menu **1040**. The hit movies menu icon along with the hit movies category letter A are displayed. The current date and time are displayed at the top of the screen over a menu background. Ten movie selections are displayed in the center of the screen **1009**, each in a box which may be highlighted when selected. In the lower left part of the screen, a logo window **1512** is available as well as two other option choices **1011**, Movie Library and Return to Cable TV. In an alternate embodiment, the return to Cable TV option is changed to return to the Home menu **1010** (or return to other viewing choices).

[**0296**] In **FIG. 18***b*, the left upper window **1002** displays current time and the right upper window **1004** displays a message. This menu provides a list of eight movie titles and their rating **1009**. If the subscriber desires further information on any particular movie he may select a movie using the cursor movement buttons and press the "go" button on the remote control **900** or set top terminal **220** box.

[**0297**] It is important in creating user friendly-interfaces that the menus are consistent and follow a pattern. A manner of making the menus is discussed below with respect to **FIGS. 55 and 56**. This consistency or pattern between the different menus provides a level of comfort to the subscriber when encountering new menus. In the major menu **1020** example of **FIG. 18***a*, the upper sash **1502** and lower sash **1504** remain consistent throughout menus in the preferred embodiment. The logos **1508**, icons **1510** and titles also remain consistent in the same locations.

[**0298**] In the major menu **1020** example of **FIG. 18***b*, the customized windows **1002**, **1004** in the upper corners

remain constant from menu to menu. Also, the name of the menu and category are at the top and center of the menu screen **1039**. To make the menu aesthetically pleasing, the instructions are given across the center of the screen and choices in large legible type are provided. Additionally, at the bottom of most menu screens **1011**, the subscriber is given the option of returning to regular TV or returning to the home menu **1010**.

[**0299**] **FIGS. 18***c*-**18***g* show alternative embodiments of major menus **1020** for the home menu shown in **FIG. 16***a*. **FIGS. 18***c*-**18***g* show various major menus directed to the type of subscription services available (basic service **1420**, basic plus **1422**, economy package **1424**, ala carte and premium channels **1426**). These menus also provide promotional or advertising information, for example, the cost for the particular subscription service. **FIG. 18***g* shows a major menu for the Learning Channel **1428**, one of the individual channels shown in the home menu of **FIG. 16***a*.

[**0300**] These menus may be grouped in similar colors or shades of colors. For example, the basic subscription service could have a light pink color. As the subscription services increase in terms of the number of channels available, the color shading may increase correspondingly. Therefore, the premium subscription service (ala carte service) would have a dark red color, contrasting with the light pink color of the basic subscription service.

[**0301**] In **FIG. 18***b*, the movie titled Terminator Four is highlighted, signifying that the subscriber has chosen this program option from the hit movie major menu. **FIGS. 19***a* and **19***b* show submenus **1050** which would follow the selection of Terminator Four on the hit movie major menu. In **FIG. 19***a*, the sash across the top of the screen **1502** remains constant from major menu **1020** to program description submenu **1050**. Again in **FIG. 19***b*, for the comfort of the subscriber, the left upper window **1002** remains the same and shows the current time. The upper right-hand corner **1004** carries a message stating the next start time for the movie selected.

[**0302**] In order to allow subscribers to view hit movies at their convenience, multiple start times for the same movie are provided. In order to provide the multiple start time service, the same movie must be shown on multiple channels at staggered start times. For example, if Terminator Four is a two-hour length movie it can be shown continuously on eight different channels, with each showing delayed fifteen minutes after the previous showing. This allows the subscriber to begin viewing the movie within a fifteen minute time interval. Since the subscriber is not required to find the channel which has the correct start time, the subscriber is unaware that the movie is being shown on eight different channels. In fact, with the use of the submenus **1050**, a subscriber is able to nearly effortlessly choose the correct channel and correct activation time for viewing the desired movie. The channel selection is invisible to the subscriber.

[**0303**] The set top terminal **220** is able to automatically determine which channel will next begin to show the selected movie using any number of techniques. For example, the set top terminal **220** will have an internal clock representing the current time. The set top terminal **220** could compare the current time with the start times for the movie on the various channels. Alternatively, a signal could be sent with the movie on all channels. This signal will set, or reset, a counter to indicate that a particular channel will next begin the movie. Those skilled in the art may recognize that other methods to determine the next available start time and channel for the selected movie are available.

[**0304**] The **FIGS. 19***a* and **19***b* movie description submenus **1120** retain the title in a window at the top center of the screen. A multiple window technique is used in the middle of this menu to display a description of the movie and one or more video frames that assist the subscriber in selecting the movie. This window of video **1556** that is provided by the menu may be a still picture, a short but repetitive video cut, or a portion of the movie that is currently showing on any one of the channels carrying the movie at the time of the submenu's **1050** display.

[**0305**] Just below the video window, the submenu provides the cost of viewing the movie and the movie length in hours and minutes. An additional strip window **1558** is provided, below the video and description windows, informing the subscriber of the movie's release date.

[**0306**] Moving towards the bottom of the menu, the subscriber is given at least three options. One, the ability to order the movie **1009**, two, to return to the hit movie menu **1011**, and three, to press "go" and return to regular TV **1011**. In the preferred embodiment, the subscriber is also given the option of previewing the movie. **FIGS. 19***a* and **19***b* show that the Order option has been selected by the subscriber **1009**.

[**0307**] **FIGS. 20***a* and **20***b* show the next submenu **1125** in the hit movie menu sequence from the selection of Terminator Four. This particular submenu **1125** shows confirmation of the subscriber's hit movie order of Terminator Four. **FIG. 20***a* retains the sash across both the top **1502** and bottom **1504** of the screen. The format of the **FIG. 20***b* menu **1125** maintains the current time in the left upper window **1002**, the title in the top center window, and the next start time in the upper right-hand window **1004**.

[**0308**] The center of the submenu screens **1125** is a video window **1556** which may be used for still or moving video. The submenu provides the subscriber with two on-screen options. The subscriber may return to regular TV **1009** or may join the movie Terminator Four already in progress **1011**. In an alternative embodiment of this submenu **1125**, the user is given the ability to return directly to the home menu screen **1010**.

[**0309**] When the movie's start time is approaching, the set top terminal **220** will automatically bring the viewer to the correct channel carrying the movie Terminator Four.

[**0310**] **FIGS. 21***a* and **21***b* are notification submenus informing the user that his program selection is about to begin (e.g., counting down until start time). Using this submenu, the set top terminal **220** warns the user prior to switching him away from the channel he is viewing to a prior selected program channel. This notification submenu is provided to the subscriber approximately one or more minutes before the set top terminal **220** changes the viewing channel.

[**0311**] Both notification submenu examples allow the subscriber to cancel his movie order. In **FIG. 21***a*, the subscriber is notified in the center of the screen that he may cancel within the first five minutes. In **FIG. 21***b* the subscriber may

press escape to cancel his order without charge. The notification submenu of **FIG. 21***b* informs the user of the start time at the upper right portion of the screen.

[0312] The notification submenu of **FIG. 21***b* is a simple three-window menu. A strip window at the top of the screen **1103** notifies the subscriber of the movie selected and the amount of time before the movie will begin. The center window is a large video window **1556** for displaying a scene from the movie. At the bottom of the screen the submenu carries another strip menu **1105** which informs the user that he may escape from his program selection without charge.

[0313] Using a notification submenu **1127**, the set top terminal **220** may allow a subscriber to view other programs prior to his movie start time. The subscriber is amply notified of the start time of his program and effortlessly moved to the correct channel to view his selected program. This notification-type submenu may be used to move a subscriber from his current channel to any preselected channel for viewing a program which has been ordered at an earlier time. In the preferred embodiment, the amount of time provided by the notification submenu may be customized by the subscriber to a length of his preference. The notification submenu also allows a subscriber to cancel or escape from his previously selected program choice and avoid any charges. If a subscriber cancels or escapes he is returned to the channel that he is currently watching.

[0314] As shown in **FIG. 22***a*, in the preferred embodiment, the subscriber is given a During Program Menu, specifically an Overlay menu **1130** to inform him when his five minutes of movie escape time have expired. Once the time has expired the subscriber will be billed for the movie selection.

[0315] **FIG. 22***b* is an overlay menu **1133** warning the user that he is escaping a program after being charged for the order of that program. The warning overlay menu **1133** of **FIG. 22***b* follows in sequence and is prompted by a hidden menu which constantly monitors for subscriber input during viewing of the program. The hit movie hidden menu (not shown) specifically waits for certain key entries by the subscriber. In particular, the hit movie hidden menu awaits for a key stroke such as escape, cancel or an icon selection. If the escape button is depressed during the viewing of a hit movie the overlay menu of **FIG. 22***a* or **FIG. 22***b* will be shown. A strip menu in the lower sash of **FIG. 22***b* allows the subscriber to resume full screen viewing of the hit movie.

[0316] **FIG. 22***b* is a representative example of an overlay menu **1133**. It has a dark lower background sash and a light colored informational sash. The upper portion of the screen continues to display the video of the program selected. **FIG. 22***c* is a reentry to ordered selection submenu **1135** for the hit movie category. The reentry to ordered selection submenus appear whenever a subscriber selects a programming option (program, event, or subscription channel), that the subscriber has already ordered. This menu has a program title window with a text title entry, and a description of the order that has already been placed for the program (or channel). In the preferred embodiment, the submenus which allow reentry to ordered selection provide the subscriber with the added option of joining the program within any fifteen minute interval. This special feature of the preferred embodiment allows a subscriber who has viewed one-half of a particular program to rejoin the program at the half-way point. In this manner, the program delivery system mimics a VCR tape recording of the program. For example, if a subscriber had rented a videotape of the movie Terminator 4 and had watched thirty minutes of the movie, he would have left his videotape in the thirty minute position. With the menu of **FIG. 22***c* a subscriber to the system who has watched thirty minutes of Terminator 4 may reenter the Terminator movie at the thirty-one to forty-five minute interval as shown in **FIG. 22***c*. The nine-fifteen minute blocks of the menu display blocks are representative of the choices available for a two-hour hit movie. Other variations are possible depending on the length of the movie and the timing intervals desired.

[0317] **FIG. 23** shows the major menu for the movie library category **1048**. The movie library category provides subscriber access to a large number of movies. Using several transmission channels, each movie in the library is shown at least once during a one-month period. Using the movie library, a subscriber may access information on a particular movie and ascertain the various start times for that movie. In the preferred embodiment, the subscriber will use the movie library in conjunction with his VCR or other video taping machinery. In that way, a subscriber may tape movies which are shown at inconvenient start times for later viewing. By activating the proper features of the set top terminal **220**, a subscriber may have the terminal activate the television and the VCR and perform all the functions necessary to tape a movie.

[0318] The movie library major menu shown is an extended menu having many follow-on extensions to the major menu shown. The extended menus continue to show lists of movies in alphabetical order. In an alternative embodiment, the movie library is broken down into subcategories of various types of movies. For instance, movie categories such as murder-mystery, documentaries, westerns, and science fiction would appear on the movie library major menu. By selecting one of these movie library subcategories the subscriber would be moved onto a particular submenu for that movie library subcategory. Each submenu would list movie titles whose contents fall within the particular subcategory.

[0319] Following a selection of a movie title, the subscriber is displayed a movie description submenu. **FIG. 24** shows a typical movie description submenu **1140**. In order to maintain a similar pattern throughout the menus, **FIG. 24**, movie description submenu **1140** for the movie library, is designed similarly to **FIG. 19***b* which is a movie description submenu for the hit movies category. The primary difference between **FIGS. 24 and 19***b* is the display of the movie library title number in the upper right-hand corner of **FIG. 24**. **FIG. 24** provides three options for the subscriber. The subscriber may order the movie described, return to the movie library major menu, or return to regular TV.

[0320] **FIG. 25** shows a confirmation submenu **1142** for the movie library. This menu screen confirms the movie selection, start date, start time and informs the subscriber that his VCR will be automatically turned on. During this submenu, the user may return to the movie library major menu, return to regular TV or cancel his movie library order by pressing the escape button. **FIG. 25** shows that the subscriber has selected to return to regular TV. The sub-

scriber's VCR or other video taping equipment must be connected to the set top terminal **220** for the automatic taping feature to operate.

[**0321**] The series of **FIGS. 26***a*, **27***a*, **28***a* and **29***a*, and the series of **FIGS. 26***b*, **27***b*, **28***b*, and **29***b* depict a typical menu sequence including a major menu **1028**, **1042** (**FIGS. 26***a* and **26***b*), a subcategory submenu **1148** (**FIGS. 27***a* and **27***b*), a program description submenu **1152** (**FIGS. 28***a* and **28***b*), and a confirmation submenu **1154** (**FIGS. 29***a* and **29***b*). This simple progression of menus repeats itself through the menu tree of **FIGS. 14***a* and **4***b*.

[**0322**] In the preferred embodiment, **FIGS. 26***a*, **27***a*, **28***a*, and **29***a* are a series of menus which are categorized in the Documentary and News Major category. Whereas in the alternate embodiment, **FIGS. 26***b*, **27***b*, **28***b*, and **29***b* are a series of menus that relate to the Discovery® video selection services category. **FIG. 26***b* is the Discovery video selection service major menu **1042**. This major menu shows twelve different categories of services available to the subscriber. The upper right-hand corner window of this major menu briefly describes the types of services which are available on this menu. After selecting a subcategory from this major menu the set top terminal **220** moves the subscriber to a submenu describing programs that are available in the subcategory. **FIGS. 26***a* and **26***b* show that the subcategory Discovery channel choice has been selected by the subscriber from a major menu.

[**0323**] **FIG. 27***a* is a submenu for subcategory Discovery channel choice **1148**, and shows six programming choices available for this subcategory. In an alternate embodiment, **FIG. 27***b* displays only four program choices. By choosing one of the programming choices on this Discovery channel choice submenu, the subscriber may obtain more information about the particular program. Again, the subscriber is able to return to the major menu or return to regular TV by selecting options in the lower part of his screen. In **FIGS. 27***a* and **27***b*, the subscriber has highlighted and selected the program War Birds for further description.

[**0324**] **FIGS. 28***a* and **28***b* are description submenus **1152** which describe an available program, War Birds. Since the preferred embodiments follow a pattern throughout the menus, **FIGS. 28***a* and **28***b* are similar to **FIGS. 24, 19***a* and **19***b* which describe other programming selections available on the system. **FIGS. 28***a* and **28***b* use the upper right-hand corner window **1004** to inform the subscriber of the next start time available for the particular program War Birds. In packaging the special selection of programs, the programmer at his option may show an identical program on several channels in order to permit the subscriber greater flexibility in start times. **FIGS. 28***a* and **28***b* show the use of a strip menu across the lower half of the screen displaying a message and the price of the program. Similar to other submenus, the subscriber may order the program, return to the major menu, or return to regular TV simply by selecting the choices on the lower part of his screen. **FIGS. 28***a* and **28***b* depict the subscriber ordering the program War Birds.

[**0325**] **FIGS. 29***a* and **29***b* are confirmation submenus **1154** similar to confirmation submenus in other major menu categories. It confirms the subscriber's order of the program War Birds. The **FIG. 29***a* confirmation submenu retains the video window from the prior submenus and also displays the program running time. The submenu of **FIG. 29***b* shows a strip window **1105** on the lower part of the screen displaying an "800" number and advertising the Discovery catalog. Similar windows may be used throughout submenus to assist in advertising for particular programs, channels, or groups of programs. Many variations of the confirmation submenu are possible.

[**0326**] This confirmation submenu allows the user to join the selected program already in progress or return to regular TV. In addition, by depressing the escape button, the subscriber may cancel his order of War Birds from this screen.

[**0327**] **FIG. 29***c* is an example of an overlay menu **1156** presented when a subscriber is exiting from a program selection in which he may rejoin at a later time. This exiting ordered program overlay menu **1156** is appropriate whenever a subscriber may return to a program or channel without additional charges. Since many of the programs selections are authorized for viewing on a two-day, weekly, or monthly basis, the exiting ordered program overlay is useful in a number of situations.

[**0328**] This overlay menu follows a similar format as other overlay menus having a darker colored lower sash and lighter colored second sash with text information. The sashes are overlayed on the program video currently being watched by the subscriber.

[**0329**] Additionally, an exiting ordered program overlay menu **1156** may be provided for one-time viewing program selections which a view cannot return. These exiting ordered program overlay menus would thank the viewer for ordering the particular program or channel and entice the viewer to order a similar program from the same network. For example, an exiting program overlay menu for a live sports event such as boxing, would thank the viewer and remind him that the network carries regularly scheduled boxing events on a weekly basis.

[**0330**] **FIGS. 30 through 34** relate to the ordering of specialty channels through the menu driven system. **FIG. 30** is a major menu **1044** that lists fifteen specialty channels that are available for subscription and viewing. In this particular major menu **1044**, the lower half of the screen **1009**, which is utilized to provide the various programming choices, is divided into three vertical sections allowing room for fifteen choices. This major menu category is different from the others in that individual programs are not ordered but instead channels are subscribed to on a monthly or yearly basis. To use this submenu, a subscriber need only select and press "go" on the channel of his choice.

[**0331**] After the subscriber selects a channel, the channel description submenu **1160** of **FIG. 31** replaces the major menu on the subscriber's television screen. This description submenu **1160** has windows that are similar to other description submenus used throughout the menu driven system. In this description submenu **1160**, the upper right-hand corner **1004** is used to display the subscription cost for the channel. The upper left-hand corner **1002** of this submenu is used to display the method in which the subscription price will be billed to the subscriber. In this specific scenario, the current time has little bearing on the subscriber's decision to order the displayed channel and therefore is not shown on the television screen. **FIG. 31** shows that the subscriber has ordered the Science Fiction channel.

[**0332**] **FIG. 32** shows a submenu **1164** which confirms the subscriber's order and thanks him for subscribing. If the

subscriber is already paying for the selected channel, instead of **FIG. 32** confirming his order, he is provided with the divided menu **1156** of **FIG. 33** informing him that he is a current subscriber of the Science Fiction channel. In both the screen of **FIG. 32** and the screen of **FIG. 33**, the subscriber is allowed to join the channel in progress. After an ample period of time for the subscriber to read the screen menu, the menu is removed from the television screen and the subscriber has a complete view of the programming in progress. This is shown in **FIG. 34** for the Science Fiction channel.

[**0333**] **FIGS. 35-38** refer to the selection of a magazine channel. In particular, **FIGS. 35-37** show a series of menus for selecting and ordering one specific magazine channel, the sci-fiction channel.

[**0334**] **FIG. 35** shows a major menu for magazine channels **1030**. This major menu falls under the letter F, Major Menu, and has an icon showing three magazines. The magazine channel major menu has a menu display block with **15** options, three columns, each with five selection options. Magazine channels are specialty channels targeted to a particular audience. In the preferred embodiment, each of the magazine channels has a monthly subscription. **FIG. 35** shows the sci-fiction magazine highlighted.

[**0335**] **FIG. 36** is a channel description submenu **1170** for the science-fiction channel. This menu has a network logo in the upper left hand part of the screen generated from the logo graphics file **820**. The name of the channel is prominently displayed across the top. In the preferred embodiment, the text for a channel or network name is stored in long-term text storage. The text description of the channel on the right part of the screen may also be stored in long-term text storage. A video window **1556** and a video description window are also shown. This channel description submenu is similar to other program description menus and exemplary of the channel description submenus for any magazine channel.

[**0336**] If the subscriber orders a science-fiction channel, he will receive the confirmation menu **1172** shown in **FIG. 37**. This is a representative confirmation menu for subscribing to any network channel. A second sash of approximately equal width to the upper sash of the background menu is displayed in a color preferably different than that of the upper sash. Within the confirmation sash, a network logo and a standard text description thanking the subscriber are placed on the screen. At any time during this menu screen, the subscriber may cancel his subscription to the channel by pressing cancel on his remote **900** or set top termination button **645**.

[**0337**] In the preferred embodiment shown, the area of the screen below the two sashes is filled with video from the channel being subscribed. In an alternative embodiment, further text information is provided instead of a video display.

[**0338**] **FIG. 38** shows a reentry to ordered subscription submenu, similar to submenu **1156** in **FIG. 33**. This particular reentry submenu (magazine channel reentry submenu **1173**) is for the magazine channel Gourmet. A light colored second sash is provided at the top of the screen with the network logo and text informing the subscriber that he has already ordered this particular channel. The reentry submenus **1156** generally allow a subscriber to immediately join programming in process. The current program on the Gourmet channel is shown in most of the remaining portion of the screen.

[**0339**] In this particular preferred embodiment shown, a special title sash is included as an overlay in the lower portion of the screen. This sash identifies the current program being shown on the channel with a text description. The set top terminal may derive this text description from either the STTCIS, the VBI, or other digital signals.

[**0340**] **FIGS. 39-42** show a series of menus for selecting the documentary news program from the CBS library, called 60 Minutes. Although this is a regularly scheduled weekly program, it may be viewed by subscribers to the present invention at nonscheduled times. **FIG. 39** shows a major menu **1028** for documentary and news programs. This major menu has a specific icon and letter designation which are shown in the upper left hand corner. This major menu has 12 selection options **1009** in the menu display blocks. They comprise two rows, each with six options. In this particular menu, the upper left hand corner option is highlighted. In general, the upper left hand corner option is the default for the cursor highlight overlay **1526**.

[**0341**] **FIG. 40** shows a subcategory submenu **1174** displaying five options. This subcategory menu shows specific programs which are available. The cursor highlight overlay is at the top of the screen in its default position. From this cursor position, the subscriber may order the program 60 Minutes.

[**0342**] **FIG. 41** shows the next menu in the sequence for ordering the program 60 Minutes. This program description submenu **1176** displays the network logo, program title, program description, video window, video description window, and the next program start time. In the preferred embodiment, the next program start time is displayed beneath the current time. The program title and program description text may be stored in the intermediary text storage **877**. In the preferred embodiment, the video description window **1556** displays running time and price of program. If the subscriber orders the program from the program description menu, he is sequenced to a confirmation menu.

[**0343**] **FIG. 42** is a confirmation submenu **1178** for the program 60 Minutes. In this embodiment shown, the program description menu and confirmation menu are nearly identical. The primary difference being the confirmation text description and ability to join the program in progress. In the embodiment shown, the confirmation text is customized for the particular subcategory CBS Library. In alternate embodiments, the confirmation text is a standard text being generated from long-term text storage. Confirmation submenus may be designed to show the user more video and less menu graphics and text.

[**0344**] **FIG. 43** is a major menu **1026** for category E, Entertainment Choice. The Entertainment Choice category shows the best entertainment programming available during a given week. **FIGS. 43 and 44** show the selection of a program in the Entertainment Choice category. The Entertainment Choice major menu **1026** has a menu display block for five programs.

[**0345**] **FIG. 44** shows a program description submenu **1182** for a selection on the Entertainment Choice major

menu. In this program description submenu, the next start is shown in the upper right hand corner. The program title text is shown centered, along with program description text on the right half of the screen. The video window and video description window are provided on the left half of the screen. In the particular embodiment shown, the price of the program is placed on the first line of text in the video description and the run time is shown on the second line of text in the video description window. The program may be ordered by highlighting the menu display block beneath the program description text using cursor movement keys. This submenu **1182** allows the subscriber, via a strip menu located in the lower sash, to return to the major menu, namely menu E **1026**.

[**0346**] **FIGS. 45 and 46** relate to the category of Children's Programs. **FIG. 45** is the major menu **1024** for Children's Programs, displaying five program options in its menu display blocks. **FIG. 46** is a program description submenu displaying the program Beauty and the Beast. This program description submenu is similar to that shown in **FIG. 44**. Again, a strip menu in the lower sash allows the subscriber to return to the major menu, in this case, menu C **1024**. In alternative embodiments, the subscriber may return to the home menu from any submenu screen. This return to home menu feature may also be embodied in a strip menu in the lower sash.

[**0347**] **FIGS. 47, 48**, and **49***a*-**49***d* relate to menus available within the major category of Sports. **FIG. 47** is an example of a major menu screen **1022** for the Sports category. This window exemplifies the ability to mix pay-per-unit programs, free programs, and a subcategory selection, all within one major menu screen. This is also representative of the mixing of programming types and subcategories that may be conducted at any menu level (major menu or submenu). By highlighting one of the three menu blocks shown, the subscriber may obtain more information on each of the three different types of programming that are available.

[**0348**] **FIG. 48** is a program description submenu **1222** for NFL Highlights, which a subscriber would receive if he made the NFL Highlights selection on the major menu **1022** of **FIG. 47**. In particular, **FIG. 48** shows a program description submenu for a program which must be paid for once each week for viewing. Once the program has been ordered by that particular set top terminal, the terminal is authorized to allow subscriber viewing for the remainder of the football week.

[**0349**] **FIGS. 49***a*-**49***d* illustrate the manner in which a category or subcategory of programs may be shown in a weekly schedule **1224**. Seven of the menu display block options of **FIG. 49***a* are for daily live events. The eighth menu selection block in the lower right hand corner of the menu display blocks allows the viewer to see what live programming is available during the month. In this manner, future television programs may be advertised.

[**0350**] **FIG. 49***b* shows a live programming event menu **1226** which is available only on a particular day. Since the text description of this menu may be updated at least once a day, circumstances which affect the live program may be described in the text. For example, in a single elimination tennis tournament, the star tennis players who have not been eliminated may be listed in the text. From this menu, the subscriber may return to the subcategory submenu, Sports Events, or return to the major menu letter B, Sports, or return to cable TV. In the preferred embodiment, the subscriber is given the ability to sequence back to his last menu screen and, in some instances, sequence back to subcategory menu screens.

[**0351**] **FIG. 49***c* and **49***d* relate to programming on a particular day (Saturday). The submenu of **49***c* falls within a subcategory of a major menu and is therefore three menu sequences below the home menu. This particular menu **1228** lists an odd number of programming options. The menu display blocks allow 12 football games selections and one boxing event, which is a larger box across the lower part of the screen. By changing the menu display block sizes, the packager can focus the subscriber's attention on a particular program. Menus may show standard time, such as eastern time, or may show regional times to the subscriber.

[**0352**] **FIG. 49***d* is a program description submenu **1229** whose description text will generally remain constant for a period of one week. The program title text "College Football" is frequently used and may be stored in long-term text storage.

[**0353**] **FIGS. 50***a* and **50***b* relate to HDTV. **FIG. 50***a* is an example of a menu **1032** advertising a new feature of the system. Promotional menus, such as **FIG. 50***a*, may be dispersed throughout the menu driven program selection system. This particular menu describes the HDTV feature and explains its unavailability until a future date. **FIG. 50***b* shows the integration of HDTV services into the menu driven program delivery system. If the subscriber selects the major menu for HDTV, he will either receive a description of the service with a suggestion to order the system, or a text note that he is a current subscriber and a listing of the currently available program selections in HDTV **1232**. If the subscriber has not paid to join the particular service, HDTV, he may be allowed to join one of the programs in progress for a limited time as a demo to entice the subscriber to order.

[**0354**] If the subscriber has paid his HDTV fees, a subscriber proceeds as he would in any other major menu screen.

[**0355**] This particular major menu shows an example of how a follow-on or second screen may exist for the same menu. In this particular case, a second screen exists for the major menu HDTV **1032**. The subscriber may access the second screen **1232** by selecting the last menu display block in the lower part of the screen "Other HDTV Selections". Following this selection, the subscriber will be given a second screen of program selections. In this manner, any menu can have multiple screens with many program choices. This type of screen pagination on one menu allows the packager to avoid categorizing program selections within that same menu. In an alternative embodiment, the options available to the subscriber may be scrolled on one menu screen with the text within the menu display blocks changing as the subscriber scrolls up or scrolls down.

[**0356**] In the preferred embodiment, TV guide services, listing programs available on network schedules, will be available on a major menu, as shown in **FIG. 51***a*. In the preferred embodiment, the major TV guide menu **1036** would offer submenus, such as network schedules for the next seven days, today's network schedules for the next six

hours, and TV guide picks for the next seven days. If the particular set top terminal **220** has been subscribed to the TV guide service, the subscriber may proceed to a submenu showing schedules of programs. If the subscriber chooses the network schedule submenu **1236**, he is offered a list of network schedules to choose from as shown in **FIG. 51***b*. If a subscriber were to choose, for instance, HBO, the submenu **1238** shown in **FIG. 51***c* would appear. This submenu allows a subscriber to choose the program date that interests him. Following selection of a date, the subscriber is shown a more specific submenu **1242** listing programs available on the particular date as shown in **51***d*.

[**0357**] Following a program choice, a program description submenu **1244** is placed on the television screen as shown in **FIG. 51***e*. In addition, from this program description submenu, the viewer may choose to record the selected program on his VCR using the guide record feature. If the guide record feature is chosen, the guide record submenu **1248** shown in **FIG. 51***f* provides the subscriber with further instructions. In order for the set top terminal **220** to perform the guide record functions and operate the VCR, control signals must be sent from the set top terminal **220** to the VCR via the video connection **650** or via a separate connection between the set top terminal **220** and the VCR. The VCR must be capable of interpreting these control signals from the set top terminal **220** and performing the desired function (such as, activating the record feature). In the preferred embodiment, the VCR control signals are sent with the video signal and output from the output **650**, as described above.

[**0358**] **FIGS. 51***g* and **51***h* refer to the broadcast TV menu option available in **FIG. 14***b*. **FIG. 51***g* is a major menu **1046** displaying subcategories of programs available on a group of channels called generically "broadcast TV." For each subcategory there is a separate submenu listing programs that are available in the particular subcategory on a group of channels called broadcast TV.

[**0359**] By using the broadcast TV menu, the subscriber does not need a written guide of available television programming on the major networks. Although the preferred embodiment categorizes television programs available on the major networks, a simple chronological listing of programs may also be used.

[**0360**] Following a subcategory selection on the broadcast TV menu such as favorite channels, the set top terminal **220** will display a submenu of programs as shown in **FIG. 51***h*. The favorite channel program menu **1256** of **FIG. 51***h* allows the subscriber to choose among eight programs in progress at 9:45 p.m. on a broadcast TV network.

[**0361**] Using this methodology, the subscriber may also be allowed to choose among television programs which will be available for viewing in the next half hour or hour. When the time of the preselected program is approaching, the set top terminal **220** will display a notification menu or window to the subscriber (similar to **FIGS. 21***a* and **21***b*) informing him of an eminent change of channels to a previously selected program.

[**0362**] In order for the set top terminal **220** to establish a favorite channel list, menus querying the subscriber and allowing the subscriber to input his selection of eight favorite channels must be displayed. Alternatively, the set top terminal **220** box can "learn" which channels are a subscriber's favorite channels. A simple learning process would involve the set top terminal **220** determining which channels were the most often watched and assume those channels are the subscriber's favorite channels. Favorite channels are preferably stored in memory in the set top terminal **220**. **FIG. 51***g*, the broadcast TV menu **1046**, has a separate category for often watched channels which allow the subscriber or the set top terminal **220** in a learning mode to choose eight additional channels for display.

[**0363**] In a manner similar to learning the most often watched channels of the subscriber, the terminal can also determine the most often watched shows by the subscriber. After developing (or learning) a list of popular shows or querying the subscriber for a list of popular shows the terminal can display a submenu allowing the subscriber to choose one of his popular shows for viewing.

[**0364**] In order for the set top terminal **220** to develop submenus for subcategories in **FIG. 51***g* which relate to the content of the programs, the terminal must receive information on the content of the programs from the Operations Center **202** (via the cable headend **208**). Normally the set top terminal **220** would receive this information in the form of the program control information signal (or STTCIS).

[**0365**] Although various embodiments of menus for broadcast TV are possible, the goals of each are the same—to eliminate or augment printed guides to television programs.

[**0366**] In an alternative embodiment, a program viewing suggestion feature is available as an additional feature. This feature gives the indecisive viewer or lazy viewer suggestions as to which programs he should watch. The set top terminal **220** uses a matching algorithm to accomplish the program viewing suggestion feature.

[**0367**] In order for the set top terminal **220** to make decisions on which programs the subscriber should watch, the terminal must create a personal profile for the particular viewer. From the data in the particular viewer's personal profile and the television program information available in the program control information signal, the set top terminal **220** is able to select a group of programs which the particular viewer is most likely to watch.

[**0368**] In order for this feature to operate, the set top terminal **220** builds a personal profile for each viewer and stores the information in a memory file by viewer name. To build a personal profile, the viewer answers a series of questions presented on a series of menu screens. These personal profile screens request the viewer to input information such as name, sex, age, place of birth, place of lower school education, employment type, level of education, amount of television program viewing per week, and the number of shows in particular categories that the viewer watches in a given week such as, sports, movies, documentaries, sitcoms, etc. Any demographic information which will assist the set top terminal **220** in suggesting television programs to the viewer may be used.

[**0369**] Once a personal profile has been created (in a particular set top terminal **220**), it can be indefinitely stored in nonvolatile memory. A selection at the home menu screen **1010** activates the program selection feature. Following activation of the feature, the set top terminal **220** will present

the viewer with a series of brief questions to determine the viewer's mood at that particular time. For example, the first mood question screen **1260** may ask the viewer to select whether he desires a short (30 minute), medium (30-60 minute), or long (60 plus minute) program selection, as shown in **FIG. 51***i*. The second mood question screen **1262** requests the viewer to select between a serious program, a thoughtful program, or a light program, as shown in **FIG. 51***j*. And the third mood question screen **1264** requests whether the user desires a passive program or an active program, as shown in **FIG. 51***k*. The viewer makes his selection in each question menu utilizing the cursor movement keys and "go" button on his remote control **900**. A variety of other mood questions are possible such as fatigue level of the viewer.

[**0370**] After the viewer has responded to the mood question menus which determine his mood, the set top terminal **220** finds the best programming matches for the viewer and displays an offering of several suggested programs to the viewer (three or more programs are preferred). The matching algorithm compares the viewer profile data with information about the program derived from the program control information (or STTCIS) signal, such as show category, description type, length, etc. Using the personal profile information and mood questions suggested above, the following types of outcomes are possible. If the set top terminal **220** is presented with a young lady viewer, educated in Boston who watches sitcoms on a regular basis, and desires a short, light, passive program, a match might be found with the 30-minute sitcom Cheers, the sitcom Designing Women and Murphy Brown. Taking another example, a middle-aged male viewer from the Boston area, wishing a longer length, light, passive program suggestion might be suggested the New England Patriots game, the Boston Red Sox game and a science fiction movie.

[**0371**] With this program selection feature, the set top terminal **220** can intelligently assist the specific viewer in selecting a television program. Instead of the set top terminal **220** requiring an input of personal profile information, the terminal may also "learn" a subscriber's viewing habits by maintaining historical data on the types of programs the viewer has most frequently watched. This information can then be fed to the matching algorithm which selects the suggested television programs.

[**0372**] Using this methodology, it is even possible for the set top terminal **220** to suggest programs for two viewers. By using two sets of viewer profile information, the matching algorithm can find the best match for joint viewing. For example, the set top terminal **220** can suggest programs for a couple watching television simultaneously.

[**0373**] **FIGS. 52***a*, **52***b*, and **52***c* demonstrate the use of promotional menus to sell subscriptions to services in the system. In particular, **FIG. 52***a* is a promotional menu **1304** for Level A interactive services. Level A interactive services offers subscribers additional information about programs such as quizzes, geographical facts, etc. This information may be received by the set top terminal **220** in several data formats including VBI and in the program control information signal. **FIG. 52***b* is a promotional menu **1306** for Level B interactive services which include a variety of on-line type services such as Prodigy, Yellow Pages, Airline Reservations, etc.

[**0374**] **FIG. 52***c* is a promotion menu **1308** for the Level C interactive services. The Level C interactive services utilize local storage such as CD technology to offer an enormous range of multi-media experiences. The Level C interactive services require a hardware upgrade as described earlier. Specially adopted CD-I and CD-ROM units are needed for this service.

[**0375**] **FIGS. 52***d* through **52***j* show menus that are available using the interactive Level A services. When interactive Levels A services are available in a television program, the system will display the interactive logo consisting of the letter "I" and two arrows with semicircular tails. In the preferred embodiment the set top terminal **220** will place the interactive logo on the television screen as an overlay menu **1310**. In the preferred embodiment, the set top terminal **220** will detect that there is data or information available about a television program which can be displayed to a subscriber using the interactive service. When the set top terminal **220** senses that there is interactive information available, it will generate the interactive logo overlay menu and place it on the television screen. For example, the set top terminal **220** will detect that information on a television program is being sent in the vertical blanking interval (VBI) and generate an interactive logo overlay menu which will appear on the subscriber's television screen for approximately fifteen seconds during each ten minute interval of programming.

[**0376**] When the subscriber sees the interactive logo on his television screen, he is made aware of the fact that interactive services are available in conjunction with his television program. If the subscriber presses his interactive remote control button, an additional overlay menu will be generated by the set top terminal **220** and placed on the screen. This menu **1310** is shown in **FIG. 52***d* being overlayed on an interactive television program. From this menu the subscriber may select interactive features or return to the television program without interactive features.

[**0377**] If the subscriber selects interactive features he will be presented with the interactive Level A submenu **1312** in **FIG. 52***e*. From this submenu the subscriber may choose a variety of different types of textual interactivity with the current television program. Some examples are quizzes, fast facts, more info, where in the world, products, etc. At any time during the interactive submenus the user may return to the television program without interactive features.

[**0378**] This interactive submenu has an example of taking a complete television program video, scaling it down to a smaller size and directing the video into a video window of a submenu.

[**0379**] **FIG. 52***f* shows an interactive fast facts submenu **1314**. In this submenu textual information is given to the subscriber in the lower half of his screen. This textual information will change as additional data is received by the set top terminal **220** relating to this television program.

[**0380**] **FIG. 52***g* shows the use of the subcategory "more information" in the interactive service. This submenu **1316** gives additional information related to the television program to the viewer in textual form in the lower half of the screen. **FIG. 52***h* is an interactive submenu **1318** for the subcategory "quiz." In this interactive subcategory, the user is presented with questions and a series of possible answers. If the subscriber desires, he selects one of the answers to the

quiz question. After his selection, the set top terminal **220** sequences to another menu. The set top terminal **220** sequences to the interactive quiz answers submenu which informs the subscriber whether he has chosen the correct answer or not. **FIG. 52***i* shows a correctly answered quiz question **1320** and **FIG. 52***j* shows an incorrectly answered quiz question **1324**. In the preferred embodiment, the menu graphics for both of these menus **52***i* and **52***j* is the same. The only difference is in the text which can be generated by the text generator of the set top terminal **220**.

[**0381**] **FIG. 53***a* is an example of a submenu for Level B interactive services. From this menu screen **1330**, any of a number of on-line data services could be accessed. In **FIG. 53***a*, the airline reservations selection has been selected by the subscriber.

[**0382**] **FIGS. 53***b* through **531** provide an example of a sequence of menus that a subscriber may encounter with an on-line data service. In particular, this example relates to airline information and reservations and the subscriber in this sequence is reserving and purchasing airline tickets. **FIG. 53***b* is an example of the first submenu **1332** for a data service offering various options. In this case, the subscriber has the option of checking current reservations or making new reservations. In each of these submenus related to a data service, the subscriber is able to return to the home menu **1010** or regular cable TV and exit the data service. **FIG. 53***c* requires the subscriber to enter information related to his airline reservation in this submenu **1334**, such as: domestic or international flight, year of flight reservation, month of flight reservation.

[**0383**] **FIG. 53***d* is another submenu in the airline information and reservation data service. **FIG. 53***d* provides an example of how the subscriber may choose among many options on a single screen **1336**. In this manner, the preferred embodiment of the system can avoid the use of a separate keyboard for textual entry. Although a separate keyboard may be provided as an upgrade, it is an added expense which some subscribers may wish to avoid. **FIG. 53***d* shows an "eye off the remote" approach to entering information. **FIG. 53***d* allows the user to chose the State in which he will depart and the state in which he will arrive. The airline information reservation submenu **1338** shown in **FIG. 53***e* allows a subscriber to choose the airports from which he will depart and arrive and also the approximate time period of his departure and his arrival. **FIG. 53***f*, an airline information and reservation submenu **1340**, allows a subscriber to view six available flights. A subscriber may select one of the flights to check on its availability.

[**0384**] **FIG. 53***g*, an airline information and reservation submenu **1342**, allows a subscriber to enter the month, day and year for the availability date he desires. In this submenu, the subscriber is offered the option of correcting any errors in the entered information. This particular submenu is for a particular flight, including flight number.

[**0385**] **FIG. 53***h*, an airline information and reservation submenu **1344**, allows a subscriber to view remaining seats available on a flight. From the menu, the subscriber may select his seat assignments. This submenu is an example of how information may be graphically shown to a subscriber using a portion of the menu and different coloring schemes. In this menu, the lower half of the screen shows the passenger compartment of an airplane with all the seat locations graphically represented by square blocks. By coloring the available seat locations in blue and the unavailable seat locations in a different color, the menu can present a great deal of information in a limited amount of space. This graphic presentation of information for the interactive on-line data services is an important method of visually displaying large amounts of information to the subscriber.

[**0386**] **FIG. 53***i*, an airline information and reservation submenu **1346**, allows the subscriber to choose a one-way or round-trip ticket and to confirm his reservations. If the subscriber desires to proceed, he may charge his airline ticket to his credit card by choosing the appropriate strip menu on the lower part of the screen.

[**0387**] **FIG. 53***j*, an airline information and reservation submenu **1348**, is an example of how credit card purchases may be made using the interactive on-line data services. In this particular menu, the subscriber is charging a round-trip plane ticket on his credit card. The subscriber simply needs to enter his credit card number, expiration date, and credit card type to charge his airline ticket.

[**0388**] **FIG. 53***k*, an airline information and reservation submenu **1350**, is an example of a menu which may be shown whenever an on-line data service is processing a request sent by the subscriber. In this particular menu, the on-line data service is processing the subscriber's credit card charge for his airline ticket.

[**0389**] **FIG. 53***l*, an airline information and reservation submenu **1352**, confirms a subscriber's airline ticket purchase and passes on information on where the ticket may be picked up.

[**0390**] **FIG. 54***a* is a major menu **1038** displaying the digital/audio program choices which are available for subscribers who have paid the monthly fee. In a chart format, the major menu shows the top five, top ten, and top forty songs available in six different categories of music. Below the chart, the system is able to provide a text message describing the particulars of the audio program selected.

[**0391**] The digital/audio feature of the invention allows a subscriber to listen to CD quality audio selections through his stereo. This can be accomplished by running cables directly from the set top terminal **220** to the subscriber's amplifier/stereo system. Alternatively, the user may listen to audio selections through his television system.

[**0392**] **FIGS. 54***d* and **54***e* are the same major menu **1038** as **FIG. 54***a* but shows a different selection and a different program description in the lower text **1408**, **1412**. From any of the menu screens for the digital/audio feature, the subscriber may return to regular cable TV with the press of a single button.

[**0393**] **FIGS. 54***b* and **54***c* are promotional menus **1400**, **1404** for the digital/audio feature. Using the same logos and menu format, the system can provide a text description enticing the subscriber to pay the monthly fee and join the service. In **FIG. 54***b*, the menu allows the user to test the system with a free demonstration. The menu in **FIG. 54***c* allows the subscriber to request additional promotional information about the system. Both **FIGS. 54***b* and **54***c* are representative of promotional menus that may be used throughout the menued system.

[0394] **FIGS. 55***a* through **55***g* and **FIGS. 56***a* through **56***g*, show how menus are generated by the set top terminal **220**. **FIGS. 55***a* through **55***g* display the building of a major menu screen for the category hit movies. **FIG. 55***a* shows the background graphics for the hit movie major menu. The background graphics **1500** comprise an upper sash **1502** across the top of the screen and a lower sash **1504** across the bottom of the screen. The background graphics are generated from the background graphics file **800** in the memory files of the graphics memory (preferably EEPROM) **620**. In particular, the hit movie major menu background graphics are located in the universal main menu backgrounds subfile **804** of the background graphics file **800**. This universal major menu background graphic **1500** is consistently used in nearly all the major menus. **FIG. 55***b* shows the logo graphics for the hit movie major menu. The logo graphics **1508** for this major menu consist of an icon window **1510**, a cable company logo **1512** in the lower left-hand portion of the screen, a channel company logo **1514** in the upper right-hand part of the screen and two "go" buttons **1516**. The icon graphics **1510** are consistently shown in each of the major menus. The cable company logo **1512** is consistently shown in the lower left-hand part of the screen in nearly every major menu. These logo graphics **1508** are created from the logo graphics file **820** in the EEPROM **620**. In particular, the cable company logo **1512** in the lower left-hand corner of the screen is located in The Your Choice TV logos **824** part of the logo graphics file. The network logo **1514** in the upper right-hand corner of the screen is generated from the network logo file **828** of the logo graphics file **820**. The "go" buttons **1516** are generated from the graphic elements file **840** of the logo graphics file **820**.

[0395] **FIG. 55***c* shows the addition of menu displays **1520** to the hit movie major menu. In particular, **FIG. 55***c* shows a ten block main menu display **1520** and a strip menu **1522** in the lower part of the screen. The ten display blocks **1520** of **FIG. 55***c* are generated from the menu display block's subfile **854** of the menu display and cursor graphics file **850** shown in **FIG. 10**. The strip menu **1522** located on the lower part of the screen is also generated from the menu display block's subfile **854**.

[0396] **FIG. 55***d* shows the addition of a cursor highlight overlay **1526** to the hit movie major menu. The cursor highlight overlay **1526** is generated from the cursor highlight overlay's submenu **858** of the menu display and cursor graphics file **850** shown in **FIG. 10**. In the preferred embodiment, the cursor highlight overlay **1526** is shown by default to be in the upper left-hand menu display block of each major menu. This cursor highlight overlay **1526** can be moved on the screen by the subscriber using his cursor movement buttons **970**.

[0397] **FIG. 55***e* shows the text **1530** generated for the hit movies major menu. In the preferred embodiment, the text **1530** is generated separately by a text generator in the set top terminal unit **220**. Those portions of the text that generally remain the same for a period of weeks or months may be stored in EEPROM **620** or other local storage. For example, the text "HIT MOVIES from"**1531** will consistently appear on each hit movies' major menu. This text may be stored on EEPROM **620** or other local storage. Further, text such as that which appears at the lower center part of the screen "PRESS HERE TO RETURN TO CABLE TV"**1532** appears many times throughout the menu sequence. This text may also be stored locally at the set top terminal **220**. Text which changes on a regular basis, such as the movie titles (or other program selections), will be transmitted to the set top terminal **220** by either the operations center **202** or the network controller **214** of the cable headend **208**. In this manner, the cable headend **208** may change the program selections available on any major menu **1020** by modifying the program control information signal sent by the operations center **202** and transmitting the change via the STTCIS. It is preferred that the text **1530** be generated separately from the graphics because the text can be stored locally in a more compact manner requiring less storage space. In addition, it allows for easy communication of text changes from the operations center **202** or cable headend.

[0398] In alternative embodiments, portions of the text, particularly those portions which remain constant, may be incorporated into the graphics and stored in either the background graphics file **800** or the logo graphics file **820**.

[0399] **FIG. 55***f* shows the addition of day **1534**, date **1536** and time **1538** information to the hit movies major menu. This information may be obtained in a variety of ways. The day, date, and time information **1540** may be sent from the operations center **202**, the cable headend (signal processor or network controller **214**), the uplink site, or generated by the set top terminal unit **220** internally. Each manner of generating the day, date, and time information **1540** has advantages and disadvantages which may change given the particular embodiment and costs. In the preferred embodiment, the day, date, and time **1540** are generated at a central location such as the operations center and are adjusted for regional changes in time at the cable headend.

[0400] **FIG. 55***g* shows the results of the information in **FIGS. 55***a* to **55***f* being integrated in the combiner **624** and then displayed on the television screen **222**. The subscriber in viewing the hit movie major menu **1040** is unaware of the fact that the menu comprises several distinct part.

[0401] **FIGS. 56***a* through **56***g* show the creation and display of a program description submenu for a hit movie. Similar to the major menu, the submenu is created in parts and combined before being sent to the television screen. **FIG. 56***a* shows the background graphics **1550** for the program description submenu. In the preferred embodiment, the upper sash **1552** and lower sash **1554** of the background graphics **1550** are stored together in one location on the EEPROM **620**. The video window and half-strip window **1558** are also co-located in storage on the EEPROM **620**. The half-strip window **1558** beneath the video window serves **1556** as a means for describing the videos shown in the video window **1556**. Both sets of graphic information **1550**, the sashes **1552**, **1554** and video window **1556** with description **1558**, are located in the universal submenu backgrounds subfile **808** of the background graphics file **800**. Both sets of backgrounds appear in many menus and are used many times during a sequence of menus.

[0402] **FIG. 56***b* shows the additional logo graphics information **1508** needed to create the program description submenu. In the preferred embodiment, the "go" logo **1516** can be stored once in memory **620** and directed to the correct portion of the screen in which it is needed for a particular memo. Similar to **FIG. 55***b*, the information needed to create the "your choice" logo **1512** and "go" buttons **1516** is stored in the logo graphics file **820**.

[0403] **FIG. 56***c* shows the addition of menu display information **1520** for the program description submenu. Similar to **FIG. 55***c*, the information needed for **FIG. 56***c* menu display blocks is stored in the menu display blocks' subfile **854** of the menu display and cursor graphics **850**. In this particular submenu, there are three menu display blocks of rectangular shape.

[0404] **FIG. 56***d* shows the addition of cursor highlight overlay information **1526** for the program description submenu. This information is obtained from the cursor highlight overlay submenu **858**. For most major menus **1020** and submenus **1050**, only one cursor highlight overlay **1526** will appear on the screen at a given time. More cursor highlight overlays **1526** will appear on a screen when the subscriber is presented with more than one question. The number of cursor highlight overlays **1526** will generally correspond with the number of questions being presented to the subscriber on the menu. The cursor highlight overlay **1526** is generally assigned a default position on each menu screen and is moved by the subscriber using either the remote control **900** or the buttons **645** located at the top of the-set top terminal **220**.

[0405] **FIG. 56***e* shows the text generation **1530** necessary for the program description submenu for a hit movie. As in **FIG. 55***e*, some of the text for the program description submenu is consistently on each program description submenu, such as "PRESS HERE TO RETURN TO CABLE TV." This-textual information may be stored locally as opposed to being derived from the STTCIS. Regardless of where the text information is stored, it must be processed through the text generator **621** before being sent to the combiner **624**.

[0406] **FIG. 56***f* shows the addition of video **1560** to the video window **1556**. In an alternative embodiment, the video shown in the program description submenu is a still picture. The still picture may be stored in a compressed format (such as JPEG) at the set top terminal **220**. These video stills **1560** that are used on program description submenus as well as other menus, may be transmitted by the operations center **202** through the program control information signal from time to time.

[0407] In the preferred embodiment, the video window **1556** shows a moving video picture. For the hit movies category, the moving video picture may be obtained directly from a current feed of the described movie. For example, the movie video **1560** shown may be taken directly off of a channel which is currently showing the movie Terminator. The set top terminal **220** would decompress the channel with the movie Terminator and then manipulate the video signal to place it in the video window **1556**. This manipulation of the video signal includes scaling down the size of the video screen and redirecting the video to a portion of the menu screen which is within the video window of the menu.

[0408] Another method of getting the moving video to the video window portion of the submenu, is to obtain the video from a split screen channel. This method involves the use of split screen video techniques to send multiple video dips on a single channel at a given time. For example, a channel may be divided into eight portions of screen space and one of the eight positions may carry the Terminator video dip. The set top terminal **220** would decompress the channel and manipulate on the one-eighth portion of the screen desired in the video window of the submenu. The set top terminal **220** would scale the one-eighth picture, if necessary, and redirect it to the correct position on the screen using known scaling and positioning techniques. Additional circuitry may be required in the set top terminal **220** to perform adequate scaling and repositioning.

[0409] **FIG. 56***g* shows the final product resulting from the combining of **FIGS. 56***a* through **56***f*. The combiner **624** integrates each of these portions of information into a single menu screen **1120**.

[0410] The combiner **624** which displays the menus on the television screen obtains information primarily from three locations, the graphics generator **622**, the text generator **621**, and the video decompressor **618** (with other video manipulation equipment, if necessary). The graphics generator **622** primarily obtains information from the graphic memory unit **620** but may receive information in the STTCIS. The text generator **621** primarily receives its information from a separate memory for text. However, in certain embodiments the text information may be stored in the graphics memory **620** or may be taken directly off the STTCIS. The video signal which is sent to the combiner **624** may come directly from one or more video decompressors or ancillary video manipulation equipment.

[0411] One of the methods for video clips or promotional video to be sent to the set top terminal **220** is through the use of split screen video techniques. **FIG. 57***a* shows the throughput of a single channel using a split screen video technique to divide the channel into four parts. In this manner, four different video dips may be simultaneously sent on a single channel. Program description submenus can acquire one of the video dips shown on the split channel at any given time. Generally, this requires the set top terminal **220** to decompress the entire channel, acquire one-fourth of the video information, scale the video (if necessary), and redirect the video. Using this split screen technique **1602**, numerous video clips may be sent over a limited number of channels.

[0412] **FIG. 57***b* shows an embodiment **1604** in which forty eight different video clips are sent simultaneously on a single channel using split screen video techniques. In this embodiment, the video signal may need to be scaled upwardly to enlarge the picture for viewing in a video window or on a full screen.

[0413] In an alternative embodiment, which avoids the need for redirecting video into the portion of the screen which houses the video window **1556**, masking and menu graphics are used to cover the portions of the channel video that are not needed. This masking technique allows the split screen video to remain in the same portion of the screen that it is transmitted by the operations center. The masking then is adjusted to cover the undesired portions of the screen. These masks would be stored in the background graphics file **800** similarly to other background files for menus. The advantage of the system is the cost savings in not needing to redirect video. The disadvantage of the system is that the video window on a description submenu, for example, would not remain in the same location from menu to menu. This inconsistency in video window location detracts from the aesthetically pleasing aspects of the menu layouts.

[0414] If the masking technique were used in conjunction with the split screen video shown in **FIG. 57***a*, each sub-

menu would have approximately one-quarter screen of video and three-quarter screen of graphic and text information. For example, a submenu or promo menu for a basketball game would mask all but the upper right-hand corner of the screen. Following masking, other background graphics **1550**, logo graphics **1508**, menu display **1520**, cursor graphics **1526**, and text information **1530** would be overlayed over the three-quarter mask. In a similar manner, a submenu or promo menu for a hockey game would also have a three-quarter mask. This three-quarter mask would mask all but the lower right-hand corner of the screen. Again, the remaining menu graphics, logos and textual information would overlay the three-quarter mask. As you can see from this example, four different three-quarter masks must be stored in the background graphics file **800** for use in the four possible video window positions.

[**0415**] The split screen video technique may also be used for promoting television programming. Since a great number of short video clips may be sent continuously (such as in **FIG. 57***b*), full or partial screen promotionals (or informationals) may be provided to the subscriber. With this large quantity of promotional video, subscribers may be given the opportunity to "graze" through new movie or television programming selections. The subscriber would simply graze from promotional video to promotional video until he found the television program of his liking. Once he has found that program he may choose to order it.

[**0416**] **FIGS. 58***a*, **58***b* and **59***a*, **59***b* relate to the monthly account review capabilities available to the subscriber. In the preferred embodiment, the subscriber may choose to access the monthly account review capability from both the introductory menu **1000** and home menu **1010**. The monthly account review screen shows alternative window types that are available to the set top terminal **220**. For example, in the upper left-hand corner of the monthly account review, the current time and date are both shown. The upper right-hand corner provides the subscriber with instructions on how to use the monthly account review capability. **FIG. 58***b* also shows that windows may be created in a variety of shapes. For instance, on the lower right-hand part of the screen **1612** two triangularly shaped windows with messages are shown. In addition, on the left lower part of the screen **1612** a window in the shape of a trapezoid is shown with a textual message inside.

[**0417**] The monthly account review provides a list of charges from the first day of the month to the date of viewing for each major menu. Charges are incurred on a pay-per-view basis and on a subscription basis (weekly, monthly, quarterly, etc.). At the lower part of the screen, the total of the charges incurred for the month is listed. The account status can also be calculated on a weekly, quarterly or semi-annual basis.

[**0418**] If the user moves his cursor to highlight one of the eight menus listed and depresses the "go" button, he will obtain further billing information on the menu. **FIGS. 58***a* and **58***b* show in screens **1610** and **1612**, respectively, the subscriber selecting menu A for further information.

[**0419**] **FIGS. 59***a* and **59***b* are submenus for the monthly account review and displays detailed billing information about selections made on menu A. The date of each movie selection, title of the movie, and price for each movie is displayed (**1614**, **1616**). Also, any discounts which have been granted are displayed. The total charges on this menu and the day in which the menu will be changed are shown in the lower part of the screen. From this submenu, the subscriber may either return to regular TV or return to the major menu for the monthly account review. If the submenu information does not fit on a single screen, an extended submenu may be utilized with follow on extension screens. Alternatively, a scrolling feature may be used enabling the subscriber to scroll additional information onto the first submenu screen.

[**0420**] The account information necessary to create the monthly account review menus may be stored either in the memory of the set top terminal **220** or at a remote location that communicates with the set top terminal **220**. In the simplest embodiment, the set top terminal **220** records a subscriber's selections locally and calculates the monthly account review based upon the subscriber's selections which require the payment of fees. This monthly account information is stored locally and sent to the cable headend **208** at least once a month for back-up and billing purposes.

[**0421**] Alternatively, the subscriber's viewing selections and billing information may be continuously maintained at the cable headend **208** or a remote site connected via communication lines to the cable headend **208**. The cable headend **208** or the remote site must regularly transmit the monthly account information to the set top terminal **220**. Each embodiment has advantages and disadvantages. If the account information and processing is done locally at the set top terminal **220**, each set top terminal **220** must be provided with the memory and necessary processing capability to maintain the account. This greatly increases the cost of a set top terminal **220**. If the account information is maintained remotely, the remote site must remain in regular contact with the set top terminal **220** in order to provide the subscriber with billing information.

[**0422**] To accommodate homes with multiple viewers two or more set top terminals **220** may be placed on a single bill or two accounts may be created for one set top terminal **220**.

[**0423**] **FIG. 60** shows an example of remote statistical and billing sites. In this arrangement, statistical and billing information from a community of set top terminals **1720** is communicated through cable headend **208** sites to regional statistical and billing sites **1730** (SBS). A regional SBS may serve several cable headend **208** sites. The regional SBS **1730** calculates billing and statistical information and passes necessary billing information back downstream through the network controller at the cable headend **208** to an appropriate single set top terminal **220** in a subscriber's home. In addition, the regional SBS communicates the billing and statistical information received on program viewer choices to the central SBS **1740**.

[**0424**] The central SBS **1740** accumulates the data received from a number of regional statistical and billing sites and calculates national statistical and billing information. In the preferred embodiment the regional SBS **1730** prints and mails bills to subscribers. The central SBS **1740** can calculate program ratings, shares and HUTS (homes using televisions) for the nation and by region. With interactive TV programs sophisticated statistical information may be gathered through the network controllers of the cable headends.

[0425] This arrangement for billing and statistical information provides the operators of the system with the advantages of distributive processing. Remote billing sites may serve regions of the country by having each cable headend **208** in a region of the country connected to one regional billing site. The information from the regional billing sites may then be communicated on a less frequent basis to the operations center or a central billing location. This method of distributed processing of billing enables the central billing location to receive fewer communications and be more efficient. In addition, the communication links between the cable headend's network controller **214** and regional sites will be of shorter distance than communication links to the operations center from the cable headends **208**. This should result in a cost savings to the system operator.

[0426] However, the regional statistical and billing may be eliminated and all communications from the cable headend **208** may proceed to the Central SBS **1740**. In fact, the Central SBS **1740** can be collocated with the Operations Center **202** and all functions performed at one central location.

[0427] If the cable program packaging and delivery system **202** is established in just one locale, the network controller **214** can perform all the statistical and billing procedures.

[0428] **FIGS. 61 through 89** are additional representative menus which include color indications.

[0429] **FIGS. 90 through 98** demonstrate the generation of menu screens.

[0430] **FIG. 99** is an example of a help menu which may be accessed from the introductory menu. In alternative embodiments, help or instruction menus may be accessed from any displayed menu. **FIG. 99** instructs the subscriber on the use of the subscriber interface (remote control unit **900**). In particular, **FIG. 99** instructs the subscriber on the use of arrow buttons for cursor movement. **FIG. 99** also shows how additional instructional information can be provided with follow-on menus by depressing "go" in the lower portion of the screen (highlighted in yellow).

[0431] **FIG. 100** is an exemplary introductory menu with access to remote instructions.

[0432] **FIGS. 101 through 131** are additional representative menus which include color indications.

[0433] **FIGS. 132 through 134** demonstrate the generation of menu screens.

What is claimed is:

1. A remote control unit adapted for use with a set-top terminal, the set-top terminal receiving a plurality of television signals and generating a plurality of menus associated with the television signals, each menu belonging to a hierarchy of menus including main menus and submenus, each menu corresponding to a single program or a group or related programs and having menu options that represent one of the programs or group of programs, the remote control unit comprising:

means within the remote control unit, for communicating with the set-top terminal to provide thereby communications adapted to allow selection of a desired program from the plurality of hierarchal menus; and

a plurality of switches, coupled to the means for communicating, comprising:

menu select switches for causing the communication of a signal adapted to directly selecting a desired menu from the plurality of hierarchal menus, each menu select switch corresponding to a particular menu and having an icon representing that particular menu, wherein a selected submenu is directly selected by depressing a menu select switch that corresponds to that selected submenu without first selecting one of the main menus; and

cursor movement switches for causing the communication of a signal adapted to moving a cursor through menu options presented on the plurality of menus;

whereby a user by touch may distinguish the cursor movement switches and menu select switches from the remainder of the plurality of switches without looking at the remote control unit.

2. The remote control unit of claim 1 wherein the plurality of switches includes two groups of switches, a standard group including volume control and channel select switches, and a special group including the cursor movement switches and the menu select switches, whereby the two groups of switches are physically separated from each other on the remote control unit proximate the center of mass of the remote control unit.

3. The remote control unit of claim 1 further comprising a joystick for cursor movement.

4. The remote control unit of claim 1 further comprising a ball for cursor movement.

5. The remote control unit of claim 1 further comprising a rolling-depressible button for cursor movement.

* * * * *