■ Programming Your Innovation 450*i*

ABOUT PROGRAMMING

Programming involves "teaching" your Innovation 450*i* to remember your satellite and channel selections. Use the control keys on the remote control to enter information into the receiver's memory.

> NOTE: The Innovation 450*i*'s extended memory allows your receiver to be shipped from the factory with many of the most popular satellites and channels pre-programmed for your convenience. Once the proper satellite is located and entered into memory, all adjustments for each channel on that satellite are done automatically. (These settings may be overridden if you should so desire.)

ON-SCREEN DISPLAY (OSD)

In order to make the setup and daily use of your new General Instrument Satellite System as simple as possible, the Innovation 450*i* Integrated Receiver Descrambler displays various operation menus directly on your television screen. Many of these menus are set up in multiple layers. You can move rapidly from one layer to another by using the number keys on your remote control and following the "roadmap" sequences illustrated below. In some cases, the number of the activity must first be selected and then one or a combination of the **[DOWN/UP, LEFT/RIGHT]** arrow keys are used to activate that function.

On some screens, the channel number is displayed in the upper right hand corner of the screen.

```
MAIN MENU
1 TIMER & CLOCK
2 PARENTAL CONTROL
3 CHN ADJUSTMENTS
4 SAT ADJUSTMENTS
5 VIEWER PREFERENCES
6 INSTALLATION
7 DEALER INFORMATION
USE 1-7
```

```
CHN ADJUSTMENTS  20
1 FINETUNE      0.00MHZ
2 FILTER             TI
3 VIDEO ATTEN      OFF
4 AUDIO ADJUSTMENTS
5 GO TO PRESET CHN

USE 1-5  ENTER
```

```
PARENTAL CONTROL        13
1 SELECT SATELLITE
2 SAT            UNLOCKED
3 CHANNEL        UNLOCKED
4 PC SYSTEM      DISABLED
5 ERASE ALL PC LOCKS
6 SET PC PASSWORD
USE 1-6  ENTER
```

```
TIMER & CLOCK
1 EVENT ONE        OFF
2 EVENT TWO        OFF
3 EVENT THREE      OFF
4 DAILY EVENT      OFF
5 CLOCK   TUE   3:15PM

USE 1-5
```

```
SAT ADJUSTMENTS
1 DISH OFFSET
2 AUTOPEAK DISH
3 AUTOPEAK SKEW
4 AUTOPEAK DISH & SKEW
5 SKEW  H:+90  V-1
        SIGNAL -88
USE 1-5  ENTER
```

```
VIEWER PREFERENCES
1 CLOCK DISPLAY     ON
2 VOLUME DISPLAY    ON
3 CH TUNING       STEP
4 PSWD TO          OFF
  SAVE DATA

USE 1-4
```

```
INSTALLATION
1 INPUT CONFIG  C/K
2 SET E/W LIMITS
3 PROGRAM SATELLITE
4 EZ SAT LOCATER
5 REALIGN & ERASE
6 SET INSTALL PSWD

USE 1-6
```

```
DEALER INFORMATION

XYZ SATELLITE
YOUR STREET
ANYTOWN, US 01234

GI 450 VER.1.0

USE ←→↓↑ TO EDIT
```

```
          MAIN MENU
       1 TIMER & CLOCK
       2. PARENTAL CONTROL

          INSTALLATION
       1 INPUT CONFIG  C/K
       2 SET E/W LIMITS

          INPUT CONFIG
       1 C/K   (POLARIZER)
       2 H/V   (TWO LNBS)
       3 LNBF 1 (SWITCHED)
       4 LNBF 2 (2ND IRD)
       5 LNBF 3
          (PULSED WIRE)

       USE 1-5
```

SETTING SYSTEM INPUT CONFIGURATION

Press the **[MENU]** and **[6]** keys on your remote control .

| MENU | | 6 |

Prior to performing any programming, it will be necessary to let your Innovation 450*i* know how your satellite system has been configured. To do so, press **[1]** for "Input Configuration."

| 1 |

Use the remote control keypad to select the appropriate configuration option as follows:

[1] for a single C- or Ku-Band LNB.

[2] for dual C-band LNBs.

[3] for C-Band, dual polarity fixed LNBs (LNBFs) with *voltage*-controlled Horizontal/ Vertical switching.

[4] for LNBF IF input from a second IRD (multiple receivers).

[5] for C-Band, dual polarity LNBFs with *pulse*-controlled Horizontal/Vertical switching.

## SATELLITE PROGRAMMING SEQUENCE

The sequence you will follow to program satellites consists of:

A) Setting the EAST/WEST antenna limits.
B) Programming satellite F4 (or the eastern-most satellite your dish can view).
C) Finding and programming satellite F3 (or the western-most satellite your dish can view).
D) Using the EZ Sat Locater to program all other satellite locations.

SETTING ANTENNA LIMITS

Antenna limits must be programmed into the Innovation 450*i* to prevent the dish from moving too far in either the east or west direction. **CAUTION! Remember to keep your eye on the dish and avoid moving it to its physical limit. If you hit a physical limit, damage could result.**

Your antenna's limits must be programmed before you can enter satellite locations into the Innovation 450*i* 's memory. NOTE: If you wish to set your E/W limits using satellites, turn on line 4 (SCAN) by pressing **[4]** and using the **[UP]** key to activate at the E/W menu.

```
          MAIN MENU
       1 TIMER & CLOCK
       2. PARENTAL CONTROL

          INSTALLATION
       1 INPUT CONFIG  C/K
       2 SET E/W LIMITS

          SET E/W LIMITS        6
       1 DISH POSITION    5000
       2 EAST LIMIT       5000
       3 WEST LIMIT       5000
       4 SCAN OFF
       5 FORMAT REVERSE
       6 PROGRAM SATELLITE

       USE 1-6
```

1. To set the EAST/WEST limits, at the "Installation" menu press **[2]** on your remote control. Hold down the **[LEFT]** arrow key on you remote control to move the dish to its east limit (**E**=Left, **W**=Right) **NOTE:** While the dish is moving, incorrect characters may appear at the top of your screen. This condition will clear up when you release the key.

| 2 | then ◄

. . . .
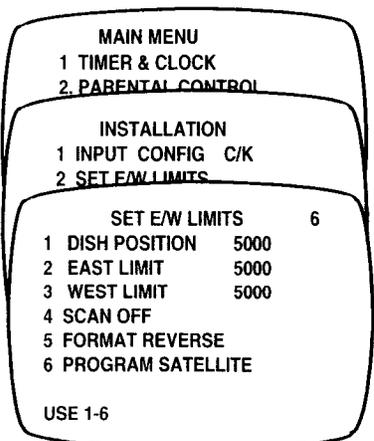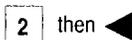
If you cannot see your dish while programming, have an assistant observe its movement to make certain that it does not travel too far (if your actuator jack does not have a physical stop) or strike an object. Your dish should move in the same direction as indicated by the key you pressed. If not, shut off your satellite system, disconnect it from the AC power source and reverse the M1 and M2 cables on the back of your unit. Reconnect the AC power and turn your system back on.

Use the **[RIGHT]** arrow key to jog the dish back slightly from the limit (about 20 pulse counts).
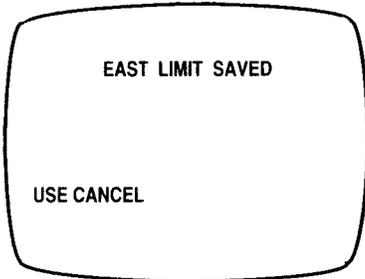
Once you are satisfied with the east limit dish location, press **[2]** to select the east limit, then **[ENTER]** to store its location.

```
EAST LIMIT SAVED



USE CANCEL
```

| 2 | then | ENTER |

2. Note: At this time you may program two satellites, later needed by the EZ SAT LOCATER, as you move the dish to the west limit. To do this press **[6]** and follow the procedure for programming a satellite outlined on page 44. We suggest that F4, channel 8, the satellite viewing guide, is easily identified. Press cancel twice from the "Data Saved" screen to return to "SET E/W Limits" screen. You will also need to program a western satellite. After programming east and west satellites proceed to set the west limit.

3. To set the West Limit, hold down the **[RIGHT]** arrow key on your remote control to move the antenna to its western-most limit. Then press **[3]** and **[ENTER]**.

▶ then ◀   [LEFT] key (about 20 pulse counts), then [3] then | ENTER |

> Note: if you turned on line 4 (SCAN) previously, you may wish to turn off line 4 (SCAN) at this point. If left on, your 450*i* will scan for video any time the dish is moved. This can make identification of individual satellites more difficult.

4. Press **[CANCEL]** on your remote control to return to the "SET E/W Limits". Pressing **[CANCEL]** a second time will return you to the "Installation Menu".

| CANCEL | | CANCEL |

> NOTE: The Innovation 450*i* can be used as a second receiver in your satellite system. To bypass the command to set the East and West Limits for your dish, set both limits to the same location (the system will not function otherwise). Press **[2]** and **[ENTER]**, then **[3]** and **[ENTER]**.

```
+----------------------------------+
|           MAIN MENU              |
|  1 TIMER & CLOCK                 |
|  2. PARENTAL LOCK                |
+----------------------------------+
|          INSTALLATION            |
|  1 INPUT CONFIG  C/K             |
|  2 SET RW LIMITS                 |
+----------------------------------+
|    PROGRAM SATELLITE    01       |
|  1 SAT --                        |
|  2 BAND C                        |
|  3 FORMAT REVERSE                |
|  4 SKEW  H : +30    V : -60      |
|  5 DISH POSITION    5000         |
|  6 SCAN OFF                      |
|  7 AUTOPEAK         -55          |
|  USE 1-7  ENTER                  |
+----------------------------------+
```
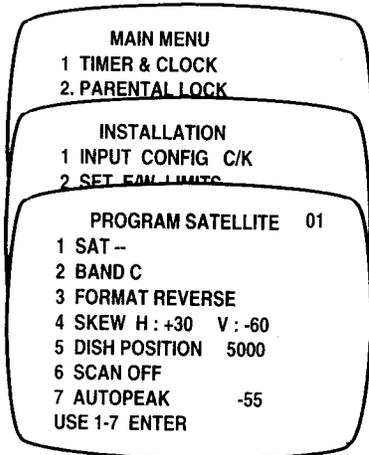
PROGRAMMING YOUR SATELLITES

A Satellite Guide will make it easy to locate and store satellites. It may be difficult to tell one satellite from another without it. Make yourself completely familiar with the following instructions by reading pages 44-54 of this guide prior to starting.

1. Press **[MENU]** to reach the "Main Menu" if you are not already there, press **[6]** for the "Installation Menu," then press **[3]**.

MENU	then	6	then	3

2. The "Program Satellite" Menu should appear as shown. The number to the right of the "Program Satellite" title is the channel indicator.

    > NOTE: 46 currently operational satellites have been pre-programmed into the Innovation 450i 's memory, including satellite names, audio and video frequencies and other settings. Once the dish is positioned on the proper satellite, all other adjustments are automatically set for you. These settings can be reset to your preference. Details may be found under "Changing Satellite Memory" on page 48.

3. Confirm that the dish is tracking the orbital arc by pressing **[5]** and then using the **[LEFT]** or **[RIGHT]** arrow key on your remote control. Line 5 will change. The Innovation 450i will automatically scan for channels while the dish is moving (if SCAN is on). When you locate a satellite, quick blinks of video will appear on the screen. Release the key and the Innovation 450i will stop scanning when a picture is detected. If you go past the satellite, back up by pressing the opposite arrow key. It is recommended that you try to identify satellite F4 first.

    You should check to see if you can receive three satellites—one on either end of the arc and one in the center. Refer to the instructions that came with your antenna for details.

    > The Innovation 450i is programmed to display a blue screen on your TV if the IRD is not receiving a signal or if the signal is very weak. You can override the blue screen within the menus by pressing the **[0]** (zero) key. Press the **[9]** (nine) key to restore the blue screen.

    > NOTE: If you change channels and lose the picture, you will need to change the format or skew for that satellite. Press **[3]** and the **[DOWN]** or **[UP]** arrow key to change the format, or press **[4]** and then the **[DOWN/UP]** arrow keys to change the skew. The picture should return. (LNBF skew is preset and cannot be changed by the user.)

```
    PROGRAM SATELLITE    01
1 SAT  G -
2 BAND C
3 FORMAT REVERSE
4 SKEW  H : +30   V : -60
5 DISH POSITION   5000
6 SCAN OFF
7 AUTOPEAK          -55
USE 1-7  ENTER
```

```
    PROGRAM SATELLITE
1 SAT  G 1
2 BAND C
3 FORMAT REVERSE
4 SKEW  H : +30   V : -60
5 DISH POSITION   5000
6 SCAN OFF
7 AUTOPEAK          -55
USE 1-7  ENTER
```

4. If you are able to identify a satellite, press **[1]** to activate the **SAT** line on the menu. The letter designation for the satellite will blink. Press the **[DOWN/UP]** arrow keys to advance the display until the letter is the same as that in your satellite guide. Notice that as you advance through the letters, the information on lines 2 through 4 may change.

   [1] then ▲▼
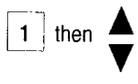
5. Press the **[RIGHT]** arrow key and the number designator will blink. Use the **[DOWN/UP]** keys to reach the correct number for that satellite. The information on lines 2 through 4 may change.

   ▶ then ▲▼
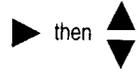
> If you should lose the picture after entering the satellite letter and number, you will need to adjust the skew as detailed in Step 6 below. There are basically two types of satellites, "normal" and "reverse." Channel 1 on normal satellites is vertical polarization. Channel 1 on reverse satellites is horizontal polarization. You can determine what polarization mode the Innovation 450*i* is in by whether the "H" or "V" is blinking on line 4 of the Program Satellite menu. Skew adjustment is not required for LNBF systems.
>
> EXAMPLE: Set the channel selector to channel 1. Enter "F4" as the satellite and the "H" on line 4 will blink. If the picture is lost after entering "F4", you will need to adjust the skew as detailed in Step 6 below. Most satellite guides list whether a satellite is normal or reverse polarization. Each satellite stored manually must be stored with the correct polarization format.

6. To set the proper skew, press **[4]** (either the "H" or the "V" will blink, indicating that the channel you have selected uses either a horizontal or vertical polarity). Use the **[DOWN/UP]** keys to obtain the best picture. Repeat this action for both an even-numbered and an odd-numbered channel.

7. Using the satellite guide, try to identify the program that appears. Use the **[CH]** key to change channels if necessary. Confirm that you are naming the right satellite.

> OPTIONAL—You can AutoPeak the skew adjustment and/or dish position prior to saving the satellite into memory.
>
> • To AutoPeak the skew only, press **[4]** and then **[7]**.
> • To AutoPeak the dish position only, press **[5]** and then **[7]**.
> • To AutoPeak both skew and dish position, press **[1]** and then **[7]**.

. . . .

```
SATELLITE DATA SAVED

USE CANCEL
```
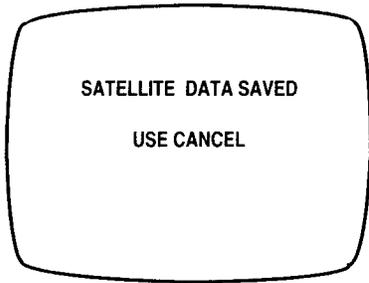
8. Having followed the above steps, you should now be ready to store the satellite by pressing **[ENTER]**. Your satellite is now stored.

| ENTER |

> IMPORTANT NOTE: It is critical that each satellite be identified correctly so that when it is programmed into memory, the factory-set adjustments match each satellite for best picture and sound. It is extremely important that the picture quality on the first two satellites you program be as good as possible.

9. To program the next satellite, press **[5]** and repeat steps 3 through 8. Select as your second satellite to be programmed one that is as far across the satellite arc from the first one as possible. We recommend using satellite F3 as the second satellite you program. After programming the two satellites, proceed to EZ Sat Locater below.

> NOTE: If you wish to search and store all satellites manually, repeat steps 3-8 for each satellite you find, otherwise continue to EZ Sat Locator.

CHANGING THE LIMITS

If the limits have been set too far towards the center of the satellite arc to receive certain satellites, reset the limits as follows:

1. Press **[MENU]** then **[6]** for the "Installation Menu," then press **[2]** to reach the "Set E/W Limits Menu."

| MENU | | 6 | then | 2 |

```
        SET E/W LIMITS      6
1 DISH POSITION      5000
2 EAST LIMIT         5000
3 WEST LIMIT         5000
4 SCAN OFF
5 FORMAT REVERSE
PROGRAM SATELLITE
USE 1-4  ← E  W →  ENTER
```

2. Depending on the limit to be changed, use the **[LEFT]** or **[RIGHT]** arrow key on your remote control to move the dish to its new limit(s). **Be sure to watch the antenna as it moves to prevent possible damage.**

◄►

3. At the new limit, press **[2]** or **[3]** depending on the limit to be changed then **[ENTER]**. Use **[CANCEL]** to return to the "Installation Menu," or the "Main Menu."

| 2 | or | 3 | then | ENTER | then | CANCEL | CANCEL |

. . . .

```
┌─────────────────────────────┐
│        INSTALLATION          │
│  ┌────────────────────────┐  │
│  │     EZ SAT LOCATER      │  │
│  │                         │  │
│  │   1  STORE C BAND       │  │
│  │   2  STORE K BAND       │  │
│  │   3  STORE C & K BAND   │  │
│  │                         │  │
│  │   USE 1-3               │  │
│  │                         │  │
└──┴─────────────────────────┴──┘
```

```
┌─────────────────────────────┐
│       EZ SAT LOCATER         │
│     SELECT ACTUATOR TYPE     │
│     1 LINEAR - EAST SIDE     │
│     2 LINEAR - WEST SIDE     │
│     3 TRANSMISSION TYPE      │
│                              │
│                              │
│     USE 1-3                  │
└─────────────────────────────┘
```

```
┌─────────────────────────────┐
│       EZ SAT LOCATER         │
│     PRESS ENTER TO STORE     │
│      OR CANCEL TO SKIP       │
│                              │
│                              │
│      EASTERN & WESTERN       │
│      SATS  ALREADY  STORED   │
│                              │
│   XX:EAST          WEST:XX   │
└─────────────────────────────┘
```
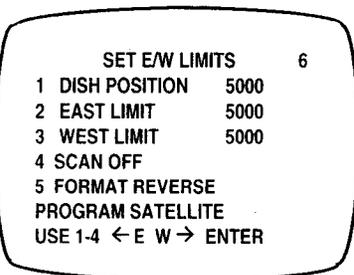
EZ SAT LOCATER (OPTIONAL SEQUENCE)

EZ Sat Locater will save a great deal of time in programming satellite positions.

1. After the second satellite has been programmed, press **[6]** to go to the "Installation Menu" and then press **[4]**. When the EZ Sat Locater screen appears, select either **[1]**, **[2]** or **[3]**, depending upon the type of system you have installed.

    | MENU | | 6 | | 4 |

    then | 1 | or | 2 | or | 3 |
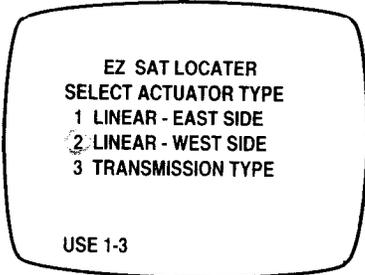
2. At the next screen, if your actuator is attached on the east side of the dish mounting pole (normal for the west coast), press **[1]**. If the actuator is attached to the west side of the mounting pole (normal for the east coast), press **[2]**. If it is a direct transmission type (such as Paraclipse), press **[3]**.

    | 1 | or | 2 | or | 3 |

    You will then be presented with a list of satellites to store into memory. Press **[ENTER]** to store. Repeat confirmation process for all the other satellites as they appear on the screen. If there is a satellite you do not wish to enter, press **[CANCEL]**.

    ┌───┐
    │ NOTE: When confirming satellites as they appear on the screen, if a │
    │ satellite should be beyond your actuator's east or west limits, you will not │
    │ be able to recall it.   │
    └───┘

SATELLITE MEMORY

The Innovation 450*i* satellite menu will store up to 64 satellites. To view all satellites that have been stored, you must use the **[DOWN/UP]** arrow keys. (The menu will scroll through all satellites which have been stored.)

Changing Satellite Memory

Factory settings for each pre-programmed satellite may be changed easily.

```
5:37 A                    F4  07
S2  F2  G2  K2→F4  T2
K1  W3  B4  G3  B3  T1
W4  R1  D1  R2  D2  M1

    DISH IS MOVING TO
    G1 AT 4634

    DISH POSITION  4150
```
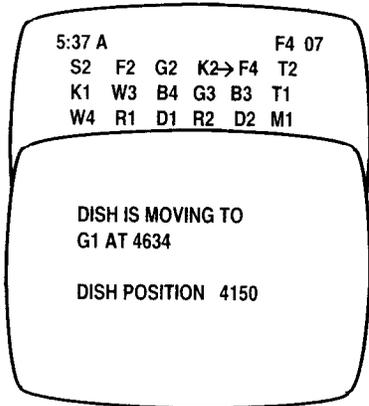
1. Press **[SAT]**, then use the **[LEFT/RIGHT, DOWN/UP]** arrow keys to reach the satellite you want to change, then press **[ENTER]**. The Innovation 450*i* will automatically move your dish to that satellite.

    [SAT] ◄✛► [ENTER]

    You may also reach a satellite by Direct Access. First press **[SAT]** and then, using the number keys on your remote, select the letter and number of the satellite you desire. (You'll notice a small letter above each number key.)

    Example: [SAT] then [4] then [4]   = Satellite F4
    (F above first 4)
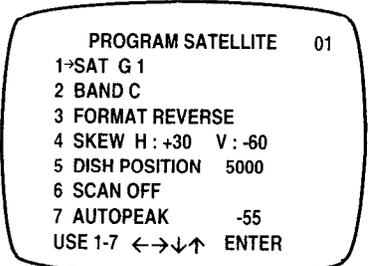
2. After the dish reaches the satellite you want to change, press **[MENU]** and then **[6]**. At the "Installation Menu," press **[3]**.

    [MENU] [6] then [3]

```
   PROGRAM SATELLITE    01
1→SAT G 1
2 BAND C
3 FORMAT REVERSE
4 SKEW  H : +30   V : -60
5 DISH POSITION   5000
6 SCAN OFF
7 AUTOPEAK          -55
USE 1-7  ←→↓↑  ENTER
```
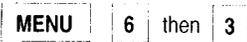
3. To change the satellite's abbreviation, press **[1]** and then the **[DOWN/UP]** arrow keys to change the letter designation. Use the **[RIGHT]** arrow key to move over to the satellite abbreviation number, then use the **[DOWN/UP]** keys to change the number.

    [1] then ▲▼ (for satellite letter), then ►▲▼ (for satellite number),
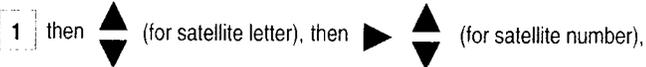
4. If it is necessary to change the satellite's frequency (C-Band or various Ku-Band), press **[2]** and the **[UP]** key. See tables on pages 52-54. Option **[2]** is not shown for LNBF systems, which are C-Band only.

    [2] then ▲

```
   PROGRAM SATELLITE   01
1 SAT G 1
2 BAND C
3 →FORMAT REVERSE
4 SKEW  H : +30   V : -60
5 DISH POSITION   5000
6 SCAN OFF
7 AUTOPEAK          -55
USE 1-7  ←→↓↑ ENTER
```
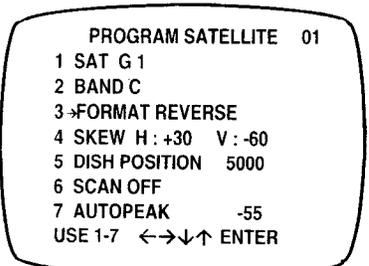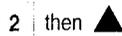
5. To change the format (Normal or Reverse), press **[3]** and then the **[UP]** arrow key.

    [3] then ▲
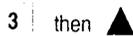
6. Press **[ENTER]**. The changes have now been stored.

    [ENTER]

```
       MAIN MENU
  1 TIMER & CLOCK

      INSTALLATION
  1 INPUT CONFIG  C/K

     PROGRAM SATELLITE   01
  1 SAT --
  2 BAND C
  3 FORMAT REVERSE
  4 SKEW H : +30    V : -60
  5→DISH POSITION    5000
  6 SCAN OFF
  7 AUTOPEAK          -55
  USE 1-7  ←→↓↑  ENTER
```
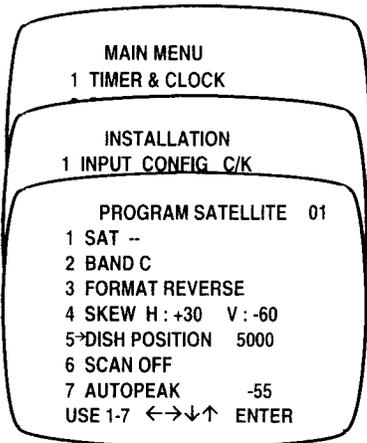
Adding New Satellites

1. Press **[MENU]**, then **[6]**, then press **[3]**. Press **[5]** and then the **[LEFT/RIGHT]** arrow keys to move the antenna to the satellite you wish to add. (You may also follow this procedure in case a satellite has moved slightly in its orbital position, which is not uncommon.)

| MENU | 6 | 3 | 5 | ◄► |
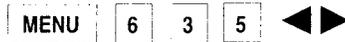
2. When you reach the satellite you wish to add, use the **[CH]** key to find a channel carrying a signal. Identify the channel to make certain that you are on the satellite you wish to add.

3. Follow steps 4 through 8 under "Programming Your Satellites" on pages 44 and 45 regarding setting the proper name, skew, format, etc.

```
  4:30 P                G1 07

   S2   F2   G2   K2   F4   T2
   K1   W3   B4   G3   B3   T1
   W4   R1   D1   R2   D2   M1
   C3   S1   W5   T3→G1  F3
   F1   F5   G2


       USE ←→↓↑ ENTER
```
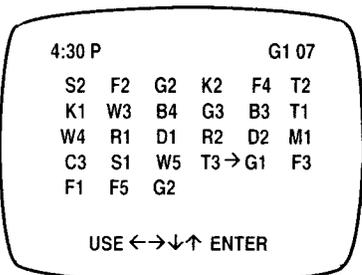
Removing a Satellite

1   Press **[SAT]** and select the satellite to be removed by using the **[UP/DOWN, LEFT/RIGHT]** arrow keys. Press **[ENTER]**. (You may also use the Direct Access method.)

| SAT | ◄✦► | ENTER |

2. After the antenna reaches the satellite to be deleted, check several channels to make certain you have the correct satellite. Press **[MENU]** and then **[6]**. At the "Installation Menu" press **[5]** and then **[4]**. Press **[1]** and then press **[ENTER]**. At the next screen, press **[CANCEL]** if you change your mind or **[ENTER]** to remove the satellite.

| MENU | 6 (password if required) | 5 | 4 | 1 | ENTER | CANCEL | or | ENTER |

```
      ERASE FUNCTIONS
       ** CAUTION! **

      ERASE FUNCTIONS
       ** CAUTION! **

        ** CAUTION! **

      THIS WILL REMOVE
        SATELLITE G1


     USE CANCEL TO  KEEP

    USE ENTER TO REMOVE
```
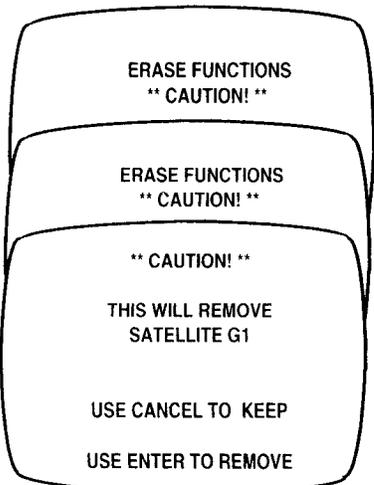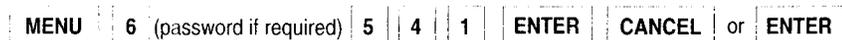
■ Satellite Transponder Plans

The following transponder plans represent the current North American satellite plans in operation. All Frequencies shown are in megahertz (MHz).

C-Band Transponder Plan			
Transponder Number	Transponder Center Frequency	Normal Format Polarity Stats: F2, T2, T1, S4, T3, C3, C4, C5	Reverse Format Polarity Stats: S2, G2, S3, G7, G3, G6, E2, E1, M1, M2, G5, A7, G1, C1
1	3720	V	H
2	3740	H	V
3	3760	V	H
4	3780	H	V
5	3800	V	H
6	3820	H	V
7	3840	V	H
8	3860	H	V
9	3880	V	H
10	3900	H	V
11	3920	V	H
12	3940	H	V
13	3960	V	H
14	3980	H	V
15	4000	V	H
16	4020	H	V
17	4040	V	H
18	4060	H	V
19	4080	V	H
20	4100	H	V
21	4120	V	H
22	4140	H	V
23	4160	V	H
24	4180	H	V

Anik E1 / E2 Ku Transponder Plan					
Xpndr No.	Xpndr Ctr. Freq	Pol.	Xpndr No.	Xpndr Ctr. Freq	Pol.
1	11717.0	V	17	11730.0	H
2	11743.0	V	18	11756.0	H
3	11778.0	V	19	11791.0	H
4	11804.0	V	20	11817.0	H
5	11839.0	V	21	11852.0	H
6	11865.0	V	22	11878.0	H
7	11900.0	V	23	11913.0	H
8	11926.0	V	24	11939.0	H
9	11961.0	V	25	11974.0	H
10	11987.0	V	26	12000.0	H
11	12022.0	V	27	12035.0	H
12	12048.0	V	28	12061.0	H
13	12083.0	V	29	12096.0	H
14	12109.0	V	30	12122.0	H
15	12144.0	V	31	12157.0	H
16	12170.0	V	32	12183.0	H

North American Ku-band Satellite Transponder/Frequency

GStar Ku Transponder Plan		
Xpndr No.	Xpndr Ctr. Freq	Pol.
1	11730.0	H
2	11791.0	H
3	11852.0	H
4	11913.0	H
5	11974.0	H
6	12035.0	H
7	12096.0	H
8	12157.0	H
9	11744.0	V
10	11805.0	V
11	11866.0	V
12	11927.0	V
13	11988.0	V
14	12049.0	V
15	12110.0	V
16	12171.0	V

GE K1 / K2 KU Transponder Plan				
Xpndr No.	Full Xpndr Ctr. Freq	Half Xpdr A Ctr. Freq	Half Xpdr B Ctr. Freq	Pol.
1	11729.0	11717.0	11741.0	H
2	11758.5	11746.5	11770.5	V
3	11788.0	11776.0	11800.0	H
4	11817.5	11805.5	11829.5	V
5	11847.0	11835.0	11859.0	H
6	11876.5	11864.5	11888.5	V
7	11906.0	11894.0	11918.0	H
8	11935.5	11923.5	11947.5	V
9	11965.0	11953.0	11977.0	H
10	11994.5	11982.5	12006.5	V
11	12024.0	12012.0	12036.0	H
12	12053.5	12041.5	12065.5	V
13	12083.0	12071.0	12095.0	H
14	12112.5	12100.5	12124.5	V
15	12142.0	12130.0	12154.0	H
16	12171.5	12159.5	12183.5	V

Spacenet S2, S3, S4, A7 Ku Transponder Plan		
Xpndr No.	Xpndr Ctr. Freq	Pol.
19	11740.0	H
20	11820.0	H
21	11900.0	H
22	11980.0	H
23	12060.0	H
24	12140.0	H

Hughes SBS-4 / SBS-5 Ku Transponder Plan		
Xpndr No.	Xpndr Ctr. Freq	Pol.
1	11725.0	H
2	11774.0	H
3	11823.0	H
4	11872.0	H
5	11921.0	H
6	11970.0	H
7	12019.0	H
8	12068.0	H
9	12117.0	H
10	12166.0	H
*11	11748.0	V
*12	11898.0	V
*13	11994.0	V
*14	12141.0	V
*SBS - 5 Single Channel Only		

Hughes SBS-6 KU Transponder Plan		
Xpndr No.	Xpndr Ctr. Freq	Pol.
1	11725.0	H
2	11749.5	V
3	11774.0	H
4	11798.5	V
5	11823.0	H
6	11847.5	V
7	11872.0	H
8	11896.5	V
9	11921.0	H
10	11945.5	V
11	11970.0	H
12	11994.5	V
13	12019.0	H
14	12043.5	V
15	12068.0	H
16	12092.5	V
17	12117.0	H
18	12141.5	V
19	12166.0	H

Morelos Frequency M1 / M2 Ku Transponder Plan		
Xpndr No.	Xpndr Ctr. Freq	Pol.
1K	11764.0	H
2K	11888.0	H
3K	12012.0	H
4K	12136.0	H

■ Receiver Frequency Plans

Your Satellite Receiver comes from the factory pre-programmed with the following satellites.

Sat. Abrev.	Satellite Name	Polarity	Channels	Location	C/Ku Plan
S2	Spacenet 2	Rev	24	069.0°	C
S2 (S7)	Spacenet 2	Nor	06	069.0°	K6-SPNT
F2	Satcom F2R	Nor	24	072.0°	C
G2	Galaxy 2	Rev	24	074.0°	C
K2	Satcom K2	Rev	16	081.0°	K16-GE
T2	Telstar 302	Nor	24	085.0°	C
K1	Satcom K1	Nor	16	085.0°	K16-GE
S3	Spacenet 3	Rev	24	087.0°	C
S3 (S8)	Spacenet 3	Nor	06	087.0°	K6-SPNT
G3	Galaxy 3	Rev	24	093.5°	C
T1	Telstar 301	Nor	24	096.0°	C
G6	Galaxy 6	Rev	24	099.0°	C
B6	SBS 6	Nor	19	099.0°	K19-SBS
S4	Spacenet 4	Nor	24	101.0°	C
S4 (S9)	Spacenet 4	Nor	06	101.0°	K6-SPNT
R1	GSTAR 1	Nor	16	103.0°	K16-GSTAR
R4	GSTAR 4	Nor	16	105.0°	K16-GSTAR
E2	ANIK E2	Rev	24	107.3°	C
E2 (A1)	ANIK E2	Nor	32	107.3°	K32-ANIK
E1	ANIK E1	Nor	24	111.1°	C
E1 (A2)	ANIK E1	Nor	32	111.1°	K32-ANIK
M1	Morelos 1	Rev	24	113.5°	C
M1 (M6)	Morelos 1	Nor	4	113.5°	K4-MORLS
M2	Morelos 2	Rev	24	116.8°	C
M2 (M7)	Morelos 2	Nor	4	116.8°	K4-MORLS
T3	Telstar 303	Nor	24	123.0°	C
B5	SBS 5	Nor	14	123.0°	K14-SBS
G5	Galaxy 5	Rev	24	125.0°	C
R2	GSTAR 2	Nor	16	125.0°	K16-GSTAR
A7	ASC 1	Rev	24	128.0°	C
C3	SatcomC3	Nor	24	131.0°	C
G1	Galaxy 1	Rev	24	133.0°	C
C1	Satcom C1	Rev	24	137.0°	C
C5	Satcom C5	Nor	24	139.0°	C

Note 1: The K26 GALX freq plan uses 3 half-transponder channnels along with 23 full-transponder channels.

Your Satellite Receiver C-band frequency plan matches the C-band satellite plan from the Transponder Plan section. The Ku band plans are shown below:

GE K1 / K2 Ku Half Transponder Plan "K32 GE HALF"					
Xpndr No.	Center Freq. (MHz)	Pol.	Xpndr No.	Center Freq. (MHz)	Pol.
1 (1A)	11717.00	H	17 (9A)	11953.00	H
2 (1B)	11741.58	H	18 (9B)	11977.00	H
3 (2A)	11746.50	V	19 (10A)	11982.50	V
4 (2B)	11770.50	V	20 (10B)	12006.50	V
5 (3A)	11776.00	H	21 (11A)	12012.00	H
6 (3B)	11800.00	H	22 (11B)	12036.00	H
7 (4A)	11805.00	V	23 (12A)	12041.50	V
8 (4B)	11829.50	V	24 (12B)	12065.50	V
9 (5A)	11835.00	H	25 (13A)	12071.00	H
10 (5B)	11859.00	H	26 (13B)	12095.00	H
11 (6A)	11864.50	V	27 (14A)	12100.50	V
12 (6B)	11888.50	V	28 (14B)	12124.50	V
13 (7A)	11894.00	H	29 (15A)	12130.00	H
14 (7B)	11918.00	H	30 (15B)	12154.00	H
15 (8A)	11923.50	V	31 (16A)	12159.50	V
16 (8B)	11947.50	V	32 (16B)	12183.50	V

GE K1 / K2 Ku Transponder Plan "K16 GE FULL"		
Xpndr No.	Center Freq. (MHz)	Pol.
1	11729.0	H
2	11758.5	V
3	11788.0	H
4	11817.5	V
5	11847.0	H
6	11876.5	V
7	11906.0	H
8	11935.5	V
9	11965.0	H
10	11994.5	V
11	12024.0	H
12	12053.5	V
13	12083.0	H
14	12112.5	V
15	12142.0	H
16	12171.5	V

Hughes SBS-4 / SBS-5 Ku Transponder Plan "K14 SBS FULL"		
Xpndr No.	Center Freq. (MHz)	Pol.
1	11725	H
2	11774	H
3	11823	H
4	11872	H
5	11921	H
6	11970	H
7	12019	H
8	12068	H
9	12117	H
10	12166	H
*11	11748	V
*12	11898	V
*13	11994	V
*14	12141	V
* SBS -5 Single Channel Only		

Hughes SBS-6 Ku Transponder Plan "K19 SBS FULL"		
Xpndr No.	Center Freq. (MHz)	Pol.
1	11725	H
2	11749.5	V
3	11774	H
4	11798.5	V
5	11823	H
6	11847.5	V
7	11872	H
8	11896.5	V
9	11921	H
10	11945.5	V
11	11970	H
12	11994.5	V
13	12019	H
14	12043.5	V
15	12068	H
16	12092.5	V
17	12117	H
18	12141.5	V
19	12166	H

Anik E1 / E2 Ku Transponder Plan "K32 ANIK FULL"					
Xpndr No.	Center Freq (MHz)	Pol.	Xpndr No.	Center Freq (MHz)	Pol.
1	11717.0	V	17	11730.0	H
2	11743.0	V	18	11756.0	H
3	11778.0	V	19	11791.0	H
4	11804.0	V	20	11817.0	H
5	11839.0	V	21	11852.0	H
6	11865.0	V	22	11878.0	H
7	11900.0	V	23	11913.0	H
8	11926.0	V	24	11939.0	H
9	11961.0	V	25	11974.0	H
10	11987.0	V	26	12000.0	H
11	12022.0	V	27	12035.0	H
12	12048.0	V	28	12061.0	H
13	12083.0	V	29	12096.0	H
14	12109.0	V	30	12122.0	H
15	12144.0	V	31	12157.0	H
16	12170.0	V	32	12183.0	H

GStar R1, R2, R4 Ku Transponder Plan "K16 GSTR FULL"		
Xpndr No.	Center Freq (MHz)	Pol.
1	11730.0	H
2	11791.0	H
3	11852.0	H
4	11913.0	H
5	11974.0	H
6	12035.0	H
7	12096.0	H
8	12157.0	H
9	11744.0	V
10	11805.0	V
11	11866.0	V
12	11927.0	V
13	11988.0	V
14	12049.0	V
15	12110.0	V
16	12171.0	V

Hughes G4 / G7 Ku Transponder Plan		
Xpndr No.	Center Freq (MHz)	Pol.
1	11720.0	V
2	11750.0	H
3	11750.0	V
4	11780.0	V
5	11810.0	H
6	11810.0	V
7	11840.0	V
8	11870.0	H
9	11870.0	V
10	11900.0	V
11U	11945.0	H
12	11930.0	V
13	11960.0	V
14L	11976.0	H
14U	12005.0	H
15	11991.0	V
16	12020.0	V
17L	12035.0	H
17U	12065.0	H
18	12050.0	V
19	12080.0	V
20	12110.0	H
21	12110.0	V
22	12140.0	V
23	12170.0	H
24	12170.0	V

Note: G4 has reverse polarity from G7.

Hughes G4 / G7 Ku Transponder Plan "K26 GALX"		
Xpndr No.	Center Freq (MHz)	Pol.
1	11720.0	V
2	11750.0	H
3	11750.0	V
4	11780.0	V
5	11810.0	H
6	11810.0	V
7	11840.0	V
8	11870.0	H
9	11870.0	V
10	11900.0	V
11 (11U)	11945.0	H
12	11930.0	V
13	11960.0	V
14 (14L)	11976.0	H
15 (14U)	12005.0	H
16 (15)	11991.0	V
17 (16)	12020.0	V
18 (17L)	12035.0	H
19 (17U)	12065.0	H
20 (18)	12050.0	V
21 (19)	12080.0	V
22 (20)	12110.0	H
23 (21)	12110.0	V
24 (22)	12140.0	V
25 (23)	12170.0	H
26 (24)	12170.0	V

Note: G4 has reverse polarity from G7.

SpaceNet S2, S3, S4, A7 Ku Transponder Plan "K6 SPNT FULL"		
Xpndr No.	Center Freq (MHz)	Pol.
19	11740.0	H
20	11820.0	H
21	11900.0	H
22	11980.0	H
23	12060.0	H
24	12140.0	H

Morelos Frequency M1 / M2 Ku Transponder Plan "K4 MORLS FULL"		
Xpndr No.	Center Freq (MHz)	Pol.
1K	11764.0	H
2K	11888.0	H
3K	12012.0	H
4K	12136.0	H

■ Pre-Installation Checklist

SYSTEM COMPONENTS
Check that all of the following items have been packed with the receiver. If any of the items are missing or appear damaged, contact your dealer.

REMOTE CONTROL UNIT
The remote control can be used to control most receiver functions. The remote control is packed inside the styrofoam end caps for shipping.

RCA-TYPE VIDEO CABLE
A video cable with two male RCA-connectors is included with your receiver. This cable can be used to interface the VIDEO OUT connector of the Innovation 450i to your video monitor.

RF CABLE
The Innovation 450i comes with one 6 ft. RF cable with two male F-connectors. This is to be used to connect the VHF OUT connector of the Innovation 450i to your TV set. A 75 ohm to 300 ohm transformer (not supplied) may be required.

RCA-TYPE STEREO AUDIO CABLE
Your Innovation 450i is supplied with a stereo audio cable with male RCA-connectors. Use this cable to connect the stereo audio output jacks to the auxiliary audio input jacks on your home stereo system, monitor/TV, or VCR.

COMPLETE THE PRE-INSTALLATION CHECKLIST

The Pre-Installation Checklist items can affect the performance of your receiver. Please review the checklist to make sure that you have completed each item that applies to the type of system that you are installing.

HOW TO USE THIS CHECKLIST

A satellite TV system has many sophisticated electronic and mechanical components in addition to the receiver. Unless these components are installed and operating correctly, you will not get the best possible reception from the system. Please make this Checklist available to any installer or service technician who is working on your satellite system.

1. Read *"Important Safeguards"* in this User's Guide.

2. Complete sections 1 and 2 on this page *before* installing the receiver.

3. Complete sections 3, 4 and 5 *before* turning the power on.

1. ELECTRICAL

___Unit is disconnected.

___Unit is attached to a properly grounded receptacle.

___AC plug is held securely in receptacle.

___Power cord is protected from pinching.

___Circuit will not be overloaded.

___Outdoor antenna is properly grounded.

___Outdoor antenna is away from power lines.

2. LOCATION

___Unit is adequately ventilated.

___Unit is not installed near a heat source.

___Unit is on a stable surface.

3. WIRING

___All wiring corresponds to manufacturer's recommendations or equivalent.

___Long cable runs have been fitted with line amplifiers.

___RG-6/RG-59 connectors have had their center wires trimmed.

___All splitters will pass DC voltage up to 20 volts.

___Actuator is wired according to diagrams.

___All F and N connectors have been weatherproofed with coax seal.

4. EQUIPMENT

___LNA/BDC, LNB or LNBF meets minimum gain guidelines.

5. DISH ADJUSTMENTS

___Polar axis has been aligned.

___Elevation has been set.

___Declination has been adjusted.

▮ Installation

. . . .

Dish Adjustments
Your dish antenna must be able to accurately track all satellites in the orbital arc without obstructions or your reception will be degraded. See the antenna manufacturer's instructions prior to beginning final satellite receiver adjustments.

Replacement Systems
If you are replacing an existing receiver with the Innovation 450*i*, do not disconnect your old system yet.

We suggest that you move the cables from the old system to the Innovation 450*i*, cable by cable. If you don't have sufficient cable length to place your Innovation 450*i* on the floor near your old system while you are transferring wires, label each wire that is attached to your old system. Then, remove your old system and attach the connectors to the Innovation 450*i*.

Wiring
Most satellite TV system wiring has standard color coding. Check the manuals for each device in your system to verify the proper coding for each wire.

DC Pass Splitters
All splitters used in your installation (for dual band, dual feed or multiple receivers) must be capable of passing a 1500 MHz signal and DC voltage even if the master receiver is turned off. If the splitters do not pass DC, you may lose video, audio, descrambler authorization or be unable to select different polarities on second receivers. Make certain that these splitters are intended for outdoor use.

Cabling
Several types of cables can be used in a standard installation. To get the best performance from your system, it is important to use the cable recommended in the chart. All system wiring should meet UL standards.

Coaxial cable can lose 10 dB or more of signal for every 100 ft. of length (dB is a measure of signal strength). This loss is called attenuation. If there is too much loss, you may have to install line amplifiers. All coaxial cable used in your Innovation 450*i* installation should be capable of a band pass of 950-1450 MHz as well as passing DC voltage up to 20 volts.

We recommend using wiring as large or larger than specified on this chart or in the previous section, "Important Safeguards."

Cable Run Loss

1.5 GHz Loss	Loss Per 100 Ft.	100'	200'	300'	400'	500'
RG-59	12db 100 Ft.	12db	24db	*	*	*
RG-6	8.5db 100 Ft.	8.5db	17db	25.5db	*	*
RG-11	6.5db 100 Ft.	6.5db	13db	19.5db	26db	*

* Indicates next larger size cable or additional amplifiers should be inserted.

RG-6 and RG-59 Cable
When using RG-6 or RG-59 cable, avoid bending the center wire. To minimize damage, we suggest that you trim the center wire back so that it extends no more than 1/16" beyond the cable end connector.

LNA/Block Downconverter, LNC or LNB
Your Innovation 450*i* *cannot* function with a Low Noise Amplifier (LNA) alone. If you are using an LNA, it will need a minimum gain of 50 dB and a Block Downconverter with a minimum gain of 20 dB.

If you are installing your Innovation 450*i* with a Low Noise Block Downconverter (LNB), it must have a minimum gain of 55 dB.

Signal Strength and Line Amplifiers
If your cable runs are over 150 ft., or if terrain or other factors affect your signal strength, you may need to install a line amplifier.

After you have completed the basic installation, check the signal strength reading on the Satellite Adjustments menu On-Screen Display (OSD). If the signal strength reading is -70 or less, installing a 950-1450 MHz 20 dB Line Amplifier on each IF IN line to the Innovation 450*i* may improve your reception.

These additions should be made after your system installation is complete.

## BASIC INSTALLATIONS

Fig. 1 Single C-Band or LNBF

NOTE: Connect the Audio Out terminals on the Innovation 450*i* to either your monitor or VCR or to your stereo.

Fig. 2 Dual LNBs

NOTE: Connect the Audio Out terminals on the Innovation 450*i* to either your monitor or VCR or to your stereo.

Fig. 3 Dual C-Band LNBs or LNBFs and Multiple Receivers

Fig. 4 Actuator Wiring Diagrams

Saginaw Actuator

TO SAGINAW ACTUATOR (ACTUATOR WITH MECHANICAL POSITION SENSOR)			
ANTENNA POSITIONER TERMINAL BLOCK	CABLE KIT WIRE (COLOR AND GAUGE)	ACTUATOR CONNECTION (EASTERN)	ACTUATOR CONNECTION (WESTERN)
+5	Orange, 22 AWG	Terminal 4	Terminal 4
Pulse	Green, 22 AWG	Terminal 5	Terminal 5
—	Black, 22 AWG	Terminal 6	Terminal 6
SH	Uninsulated Drain Wire	As shown	As shown
M1	Red, 14 AWG	Terminal 2	Terminal 1
M2	White, 14 AWG	Terminal 1	Terminal 2

Transmissions-type

TO TRANSMISSION-TYPE DRIVE (MOTOR WITH REED SWITCH POSITION SENSOR)			
ANTENNA POSITIONER TERMINAL BLOCK	CABLE KIT WIRE (COLOR AND GAUGE)	ACTUATOR CONNECTION (EASTERN)	ACTUATOR CONNECTION (WESTERN)
+5	No Connection	No Connection	No Connection
Pulse	Green, 22 AWG	Terminal 1	Terminal 1
—	Black, 22 AWG	Terminal 2	Terminal 2
SH	Uninsulated Drain Wire	Terminal 3	Terminal 3
M1	White, 14 AWG	Terminal 4	Terminal 5
M2	Red, 14 AWG	Terminal 5	Terminal 4

Warner Actuator

TO WARNER ACTUATOR (ACTUATOR WITH REED SWITCH POSITION SENSOR)			
ANTENNA POSITIONER TERMINAL BLOCK	CABLE KIT WIRE (COLOR AND GAUGE)	ACTUATOR CONNECTION (EASTERN)	ACTUATOR CONNECTION (WESTERN)
+5	Orange, 22 AWG	No Connection	No Connection
Pulse	Green, 22 AWG	Terminal 1	Terminal 1
—	Black, 22 AWG	Terminal 2	Terminal 2
SH	Uninsulated Drain Wire	Terminal 4	Terminal 4
M1	Red, 14 AWG	Terminal 6	Terminal 5
M2	White, 14 AWG	Terminal 5	Terminal 6

General Instrument

TO GENERAL INSTRUMENT ACTUATOR (ACTUATOR WITH REED SWITCH POSITION SENSOR)			
ANTENNA POSITIONER TERMINAL BLOCK	CABLE KIT WIRE (COLOR AND GAUGE)	ACTUATOR CONNECTION (EASTERN)	ACTUATOR CONNECTION (WESTERN)
+5	Orange, 22 AWG	No Connection	No Connection
Pulse	Green, 22 AWG	Terminal 2	Terminal 2
—	Black, 22 AWG	Terminal 3	Terminal 3
SH	Uninsulated Drain Wire	Terminal 4	Terminal 4
M1	Red, 14 AWG	Terminal 6	Terminal 5
M2	White, 14 AWG	Terminal 5	Terminal 6

EAST/WEST CONNECTIONS

NOTE: Eastern refers to the US east of 104° west longitude.

Western refers to the US west of 104° west longitude.

BASIC RECEIVER CONNECTIONS

Most Innovation 450i's will be used in single feed, single receiver installations. Please refer to the wiring diagrams on pages 58 and 59 to see how your installation should be wired.

1. Check to make certain that your system is not connected to any AC power.

2. Connect your VHF input cable (cable service, roof antenna, etc.) to the "VHF IN FROM ANT" connector "B13" on the Innovation 450i.

   The VHF input cable to the Innovation 450i should be 75 ohm impedance (round). If you have 300 ohm (flat cable) coming from your antenna, you will need to purchase an inexpensive 300-75 ohm transformer (available at most home centers, department stores, electronics shops, etc.).

   Should you wish to watch or record UHF programming, you will need to connect the UHF antenna directly to your TV set or VCR.

3. If you are using a regular TV set, attach the standard 75 ohm (round) cable (supplied) from the "VHF OUT TO TV" connector "B15" on the Innovation 450i to the "VHF ANT" input on your TV. (You may need to purchase a 75-300 ohm transformer. Please note that this adapter is different from the one mentioned under Step 2).

   If you are using a TV monitor, use the RCA-type video cable, (supplied) to connect the "VIDEO OUT" connector "B4" on the Innovation 450i to the video input connector on your monitor. Using the RCA-type stereo audio cable supplied, attach the "R (Right)" and "L (Left)" audio output connectors "B5" on

the Innovation 450i to the audio inputs on your TV monitor or separate stereo receiver.

4. For all except pulse-controlled switching LNBF systems, connect the wires from the polarizer (feedhorn) out at your antenna to the lower terminal block "B11" on the back of the Innovation 450i as follows:

| +5V | PULSE | GND | C/Ku |
| +5V | PULSE | GND | H/V |

Black ground wire.
White pulse wire.
Red 5-volt wire.
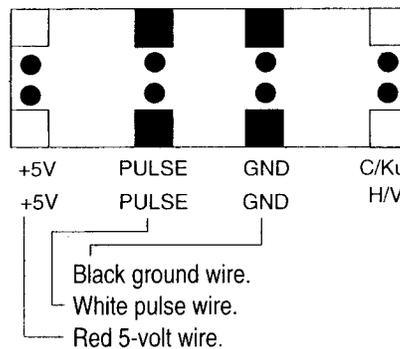
Feedhorn Connections

   For LNBFs with pulse-controlled switching, connect the single wire from the feedhorn to the terminal "B11" lower PULSE connector. If your system makes use of a single C-Band, or LNBF, attach the 950-1450 MHz IF cable (round) from the feedhorn to the C/H "B2" connector. (See Figure 1, Page 58.)

5. If your system uses dual C-Band LNBs (horizontal and vertical), attach the vertical LNB to "B1" and the horizontal LNB to "B2". (See Figure 2, Page 58.)

   For single C-Band LNB/single Ku-Band LNB systems, connect the Ku-Band LNB to "B1" and the C-Band LNB to "B2" (See Figure 2, Page 58.)

   For systems using dual C-Band LNBs or LNBFs with multiple receivers, please see Figure 3 on Page 59.

6. Connect the Innovation 450i's internal antenna positioner power

supply (upper row of terminals) to your antenna actuator jack to control dish movement. Wiring the power supply depends on the type of actuator that you have. **_Do not attempt any of this wiring with the Innovation 450i plugged into an AC power source!_**

Motor wire should be a minimum of 14 gauge. Sensor wire should be shielded 20 gauge. See the wiring diagrams on page 59.

Orange wire — Green wire — Brown wire

| +5V | PULSE | GND | C/Ku |
| +5V | PULSE | GND | H/V |
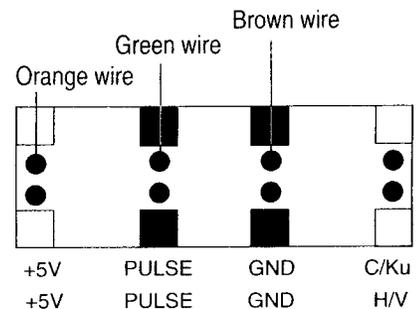
Actuator Jack Connections

NOTE: An internal jumper must be changed to provide +12 VDC for use with optocoupler actuator jacks. (This procedure must be done only by authorized General Instrument dealers or technicians.)

AUDIO-VIDEO CONNECTIONS

Many standard satellite TV accessories can be used with the Innovation 450i, including VCRs, TV monitors, cable system converters, and your stereo system. Figures 5 and 6 detail two different configurations that are possible.

Please note that there are several different ways of hooking up your system, according to your preferences. Consult the owner's manuals that came with the components you wish to connect to the Innovation 450i and be aware that their installation diagrams may vary from those shown here. Your

satellite system or audio/video dealer may also be able to help you.

> NOTE: The cables supplied with your unit will allow you to set up your VCR system according to Figure 5. Additional cables will be required for the setup shown in Figure 6.

Pay careful attention to the audio and video outputs you select for use with your VCR. Be aware that using the

video input on some VCRs eliminates their ability to record programs off the air.

Check all your connections prior to connecting the system to AC power.

Continuation of Audio-Video Connections

After all wiring connections have been made and you have completed the installation, connect your Innovation 450*i* to an AC power source (wall outlet) that is not controlled by a wall

switch. This will help avoid accidentally shutting off your system.

> NOTE: Even when you shut the receiver off, it actually remains in a standby mode so that it can receive VideoCipher authorization messages and supply a small but constant amount of power to the LNB(s) out at your antenna. This limits condensation from forming inside the LNB and possibly damaging it.

Fig. 5 Connecting a TV, a VCR and a Stereo System (Option 1)
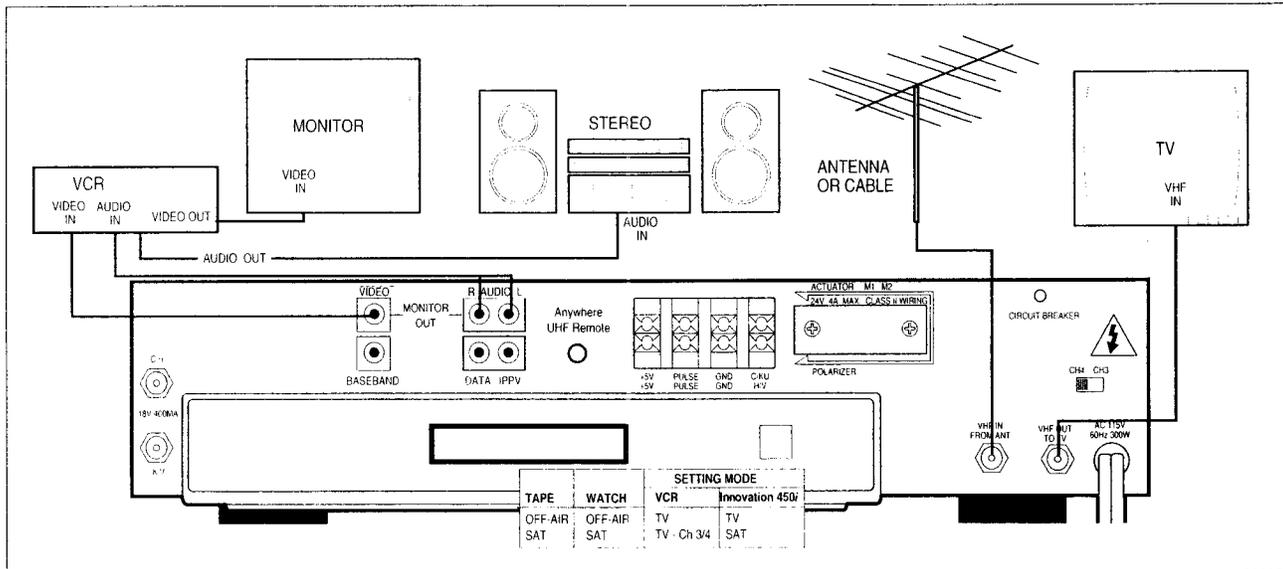
Fig. 6 Connecting a TV, a VCR and a Stereo System (Option 2)
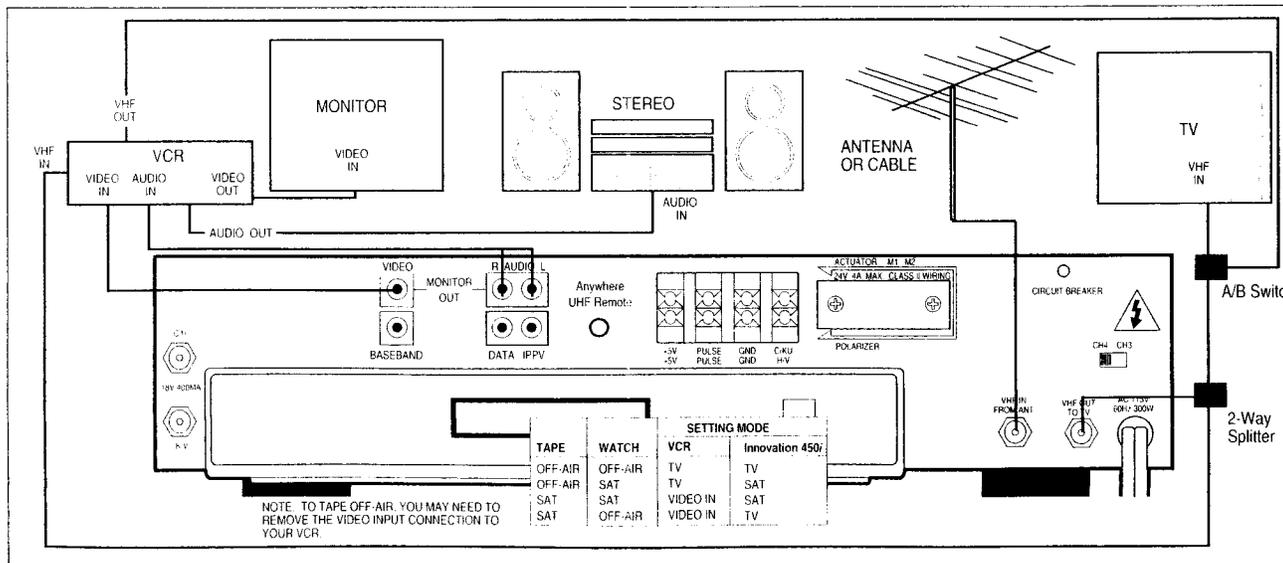
INSTALLATION PASSWORD

Once your satellite system has been installed and programmed, an installation password feature can be used to prevent others from changing any of the settings you have installed.

```
NOTE: If you activate this password function, it will be necessary to enter
it every time you wish to change most system settings.
```
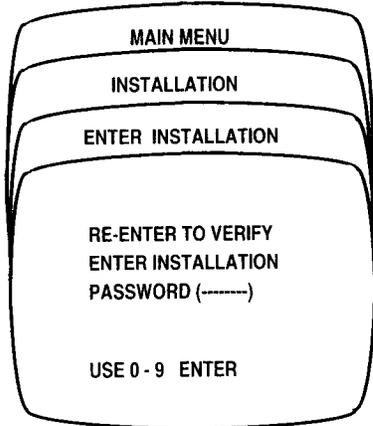
1. Press **[MENU]** and then **[6]**, then press **[6]**. Enter an easy-to-remember password (address, zip code, etc., may be one to eight digits). Then press **[ENTER]**.

    | MENU | 6 | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ENTER |
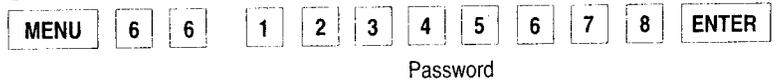
    Password

2. Re-enter the password to confirm and press **[ENTER]**. The password has been stored.

    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ENTER |
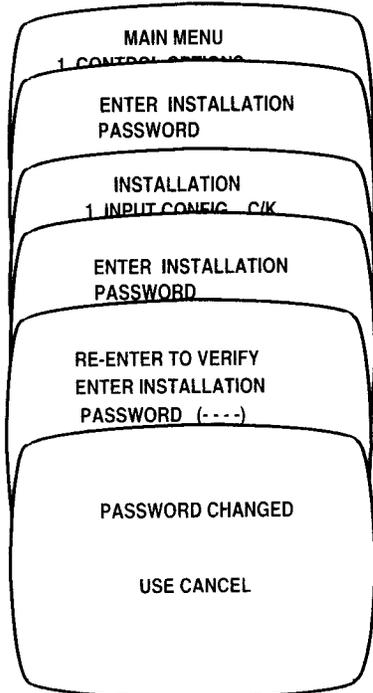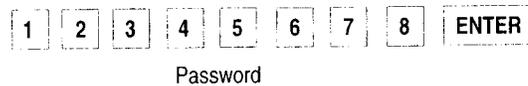
    Password

Changing an Installation Password

1. Press **[MENU]** then **[6]** and your present password, then **[ENTER]**. Press **[6]** and enter your new password. Press **[ENTER]**. Re-enter the new password to confirm and press **[ENTER]**. The new password has been stored.

    | MENU | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ENTER |

    Old Password

    | 6 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | ENTER |

    New Password

    | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | ENTER |
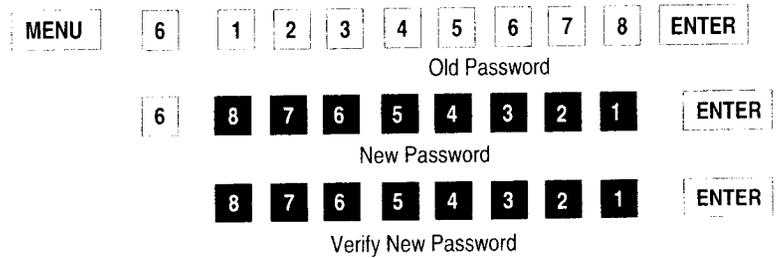
    Verify New Password

Removing an Installation Password

1. Press **[MENU]** then **[6]** and your present password, then **[ENTER]**. Press **[6]**. After pressing **[6]**, press **[ENTER]**. DO NOT ENTER A PASSWORD. The old password will be removed.

    | MENU | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ENTER |

    Password

    | 6 | ENTER |

MAIN MENU
INSTALLATION
ENTER INSTALLATION

RE-ENTER TO VERIFY
ENTER INSTALLATION
PASSWORD (--------)

USE 0 - 9   ENTER

MAIN MENU
1 CONTROL OPTIONS
ENTER INSTALLATION
PASSWORD

INSTALLATION
1 INPUT CONFIG. C/K

ENTER INSTALLATION
PASSWORD

RE-ENTER TO VERIFY
ENTER INSTALLATION
PASSWORD (----)

PASSWORD CHANGED

USE CANCEL

PASSWORD CLEARED

USE CANCEL

REALIGN & ERASE

Major changes to your Innovation 450*i*'s memory can be made under "Realign & Erase." **Any such changes should be considered with great care as it will be very time consuming to re-enter the information that will be erased during these fuctions.**

LNB Compensation

If it is necessary to fine tune more than three channels on the same satellite every time you change channels, your C-Band or Ku-Band LNB may be experiencing frequency drift due to weather conditions or manufacturing variances.

```
INSTALLATION

REALIGN & ERASE

1 REALIGN ALL SATS
2 CLNB COMP+  0.25MHZ
3 KLNB COMP   0.00MHZ
4 ERASE FUNCTIONS

USE 1-4
```

NOTE: Perform these adjustments only after you have completely set up and programmed your satellite system.
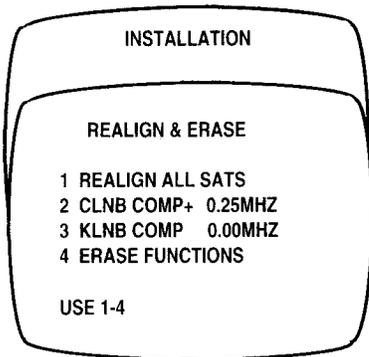
1. At the "Installation Menu," press **[5]**. When the "Realign & Erase" menu appears, press **[2]** to activate the C-Band LNB compensation or **[3]** for the Ku-Band compensation. Using the **[DOWN/UP]** arrow keys, adjust the LNB compensation setting for best picture. All channels will be offset by this same amount.

    | MENU | 6 | 5 | 2 | or | 3 | then ▲▼

2. When finished, go back to those channels you manually adjusted prior to activating the LNB Compensation procedure and reset to best picture (usually 0.00MHz). Press **[ENTER]** when adjustments are completed.

    | VIEW | ▲▼ | ENTER | (password if required)

```
MAIN MENU
1 TIMER & CLOCK

INSTALLATION
1 INPUT CONFIG.  C/K
2 SET E/W LIMITS
3 PROGRAM SATELLITE
4 EZ SAT LOCATER
5 REALIGN & ERASE
6 SET INSTALL PSWD

USE 1-6
```
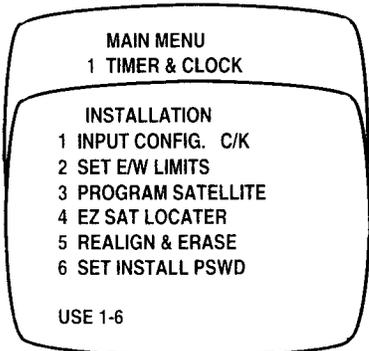
Realign all Satellites

If the position of your antenna should change (due to extreme weather conditions or repair), it will be necessary to realign the dish to the proper satellite locations. Using the Realign all Satellites, should eliminate having to reset each satellite's location in the Innovation 450*i*'s memory.

1. Press **[MENU]** and then **[6]**. Enter your password (if necessary) and then press **[5]**.

    | MENU | 6 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ENTER | 5 |
    Password

```
REALIGN & ERASE

G1 15

ALL SATELLITES
WILL BE REALIGNED

FIND W5 NEW LOCATION
DISH POSITION 4726
USE ←E W → ENTER
```

2. Press **[1]** and use the **[LEFT/RIGHT]** arrow keys to locate the satellite abbreviation shown on your TV screen. When you have found it, press **[ENTER]**. Your entire system should now be realigned.

    | 1 | ◄► | ENTER |
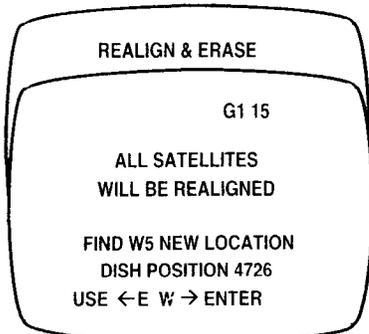
CAUTION: Make certain that you have located the correct satellite or the Innovation 450*i* will not function properly.
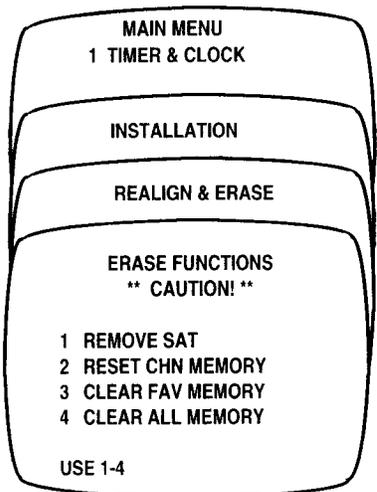
Erase Functions

Within the "Erase Function" menu memory for a channel, favorite channels, or all memory may be erased.

Remove a Satellite

1. Press **[MENU]** then **[6]**, (password if necessary) then **[5]** and **[4]**. At the "Erase Functions" menu press **[1]** and the **[DOWN/UP]**, **[LEFT/RIGHT]** arrow keys to select the satellite to be removed. Press **[ENTER]** and at the caution screen press **[ENTER]** again to remove the satellite.

```
MENU    6   5   4   1         ENTER   ENTER
```

MAIN MENU
1 TIMER & CLOCK

INSTALLATION

REALIGN & ERASE

ERASE FUNCTIONS
** CAUTION! **

1 REMOVE SAT
2 RESET CHN MEMORY
3 CLEAR FAV MEMORY
4 CLEAR ALL MEMORY

USE 1-4

REALIGN & ERASE

ERASE FUNCTIONS
** CAUTION! **

** CAUTION! **

THIS WILL RESET
MEMORY FOR
ALL CHANNELS

USE CANCEL TO STOP

USE ENTER TO RESET
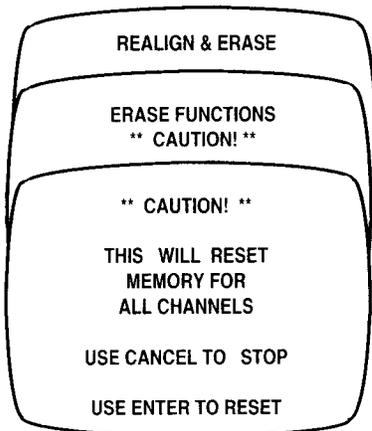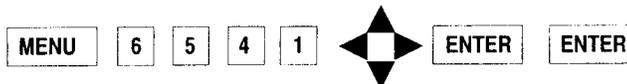
Reset Channel Memory

1. To return all channels to original factory settings, press **[MENU]** and then **[6]**, (password if necessary) then press **[5]** again. At the "Realign & Erase" menu press **[4]** and then **[2]**. Then press **[ENTER]**.

```
MENU    6   5   4   2   ENTER
```

All pre-programmed channels will revert to their factory settings; all settings for other channels will be erased. Press **[CANCEL]** to cancel the action.

```
CANCEL
```

```
** CAUTION! **

THIS WILL CLEAR
FAVORITE MEMORY

USE CANCEL TO STOP

USE ENTER TO RESET
```

Reset Favorite Channel Memory

1. To reset favorite channels you may have programmed, press **[MENU]** and then **[6]**, then press **[6]** again. At the "Extra Functions" menu, press **[4]** and then **[3]**.

| MENU | 6 | 6 | 4 | 3 |

2. When the next screen appears, press **[ENTER]**. The Favorite Channels will return to their original factory settings. Press **[CANCEL]** if you wish to cancel the action.

| ENTER | or | CANCEL |

```
MAIN MENU
1 TIMER & CLOCK

INSTALLATION
1 INPUT CONFIG C/K

REALIGN & ERASE

1 ERASE FUNCTIONS
CAUTION!
1 REMOVE SAT F4

** CAUTION! **

THIS WILL CLEAR
ENTIRE MEMORY!
UNIT WILL BE TURNED OFF

USE CANCEL TO STOP

USE ENTER TO CLEAR
```

Clear All Memory

1. To clear the entire memory of any settings you may have entered, (including antenna limits, passwords, audio or skew adjustments, etc.), press **[MENU]** and **[6]**, and then enter your password (if necessary).

> NOTE: Factory settings will not be erased, only those changes or new satellites or channels you have entered. Reinstallation will be required.

| MENU | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ENTER |
Password

2. Press **[6]** and then **[5]**. Press **[4]** and press **[4]** again. The memory (including all passwords) is erased when you press **[ENTER]**. To cancel the action before erasing, press **[CANCEL]**.

| 6 | 5 | 4 | 4 | ENTER | or | CANCEL |

```
DEALER INFORMATION

XYZ SATELLITE
ANY STREET
ANYTOWN, USA
GI 450          VER 1.0

USE  ←→↓↑  TO EDIT
```

DEALER INFORMATION

The Innovation 450*i* can be programmed with your dealer's name, address, and phone number. At the "Main Menu" press **[7]**, then use the **[DOWN/UP, LEFT/RIGHT]** arrow keys to enter characters. Press **[ENTER]** when done.

▲
▼ to select character.

◄► to select character location.

▌VIDEOpal® Order Recorder Installation

NOTICE FOR CANADIANS

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system (if present) are connected together. This precaution may be particularly important in rural areas.

> **CAUTION:** Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician.

The Load Number for the VCRS with the internal VIDEOpal system is 7.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the load numbers of all the devices does not exceed 100.

The Standard Connecting Arrangement Code for the VCRS with the internal VIDEOpal system is CA11A.

INSTALLATION INFORMATION

FCC-Required Notification
Type Of Service
The built-in VIDEOpal system in the VCRS module is designed to be used on standard telephone lines and connects to the telephone line by means of a standard jack called the USOC RJ11C. Connection to telephone company-provided coin service (central office implemented systems) is prohibited.

Telephone Company Procedures
In order for your telephone company to provide you service, it may occasionally be necessary for them to make changes in their equipment, operations, or procedures. If these changes affect your service or the operation of your equipment, the telephone company should give you notice, in writing, to allow you to make any changes necessary to maintain uninterrupted service. If you have any questions about your telephone line, such as how many pieces of equipment you can connect to it, your telephone company should provide this information upon request. In certain circumstances, it may be necessary for your telephone company to request information from you concerning the equipment which you have connected to your telephone line. Upon request of your telephone company, provide the FCC registration number and the Ringer Equivalence Number (REN) of the equipment which is connected to your line; both of these items are listed on the equipment label. The sum of all the RENs on your telephone lines should be less than five in order to assure proper service from your telephone company. In some cases, a sum of five may not be usable on a given line.

> NOTE: The REN for your built-in VIDEOpal system in the VCRS module is 0.3B.

If Problems Arise
If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If your telephone company notes a problem, they may temporarily discontinue service. When practical, they will notify you in advance of this disconnection. If advance notice is not feasible, you should be notified as soon as possible. When you are notified, you should be given the opportunity to correct the problem and be informed of your right to file a complaint with the FCC.

> NOTE: The VIDEOpal Order Recorder will not work properly at this time if you are on a party line or if operator assistance is required to make long distance telephone calls. Also, if you do not have access to the phone jack on the back of your receiver, you may require an external VIDEOpal Order Recorder; or, your receiver may not allow for VIDEOpal operation. Contact your local dealer to purchase the external recorder. To determine compatibility, contact your receiver manufacturer.

. . . .

PRE-INSTALLATION CHECKLIST OF SYSTEM COMPONENTS

Check that all of the following items have been packed with your Innovation 450i. If any of the items are missing or appear damaged, contact the dealer from whom you purchased the unit or the General Instrument Service Center (see back inside cover for phone number).

6 Ft. Modular Phone Cord
This modular phone cord connects the VIDEOpal system directly to your home telephone system.

50 Ft. Modular Phone Cord
Use to connect the VIDEOpal system to your telephone system. It may also be used to connect both your telephone and the VIDEOpal unit to the same phone outlet.

Tap-In Clips
To secure the telephone cable along baseboards, a supply of tap-in clips is provided. See page 70.

The VIDEOpal Feature and Your Telephone System
Although other types of connector systems can be found, the most common types of home phone connections are:

Modular

4-Prong

Hard-wired

If You Need Assistance:
If you prefer, any required phone system alterations can be done for you by your local phone company or an independent telephone equipment service. Check in the phone book yellow pages under, "Telephone Equipment and Installation – Dealers." Inquire about any charges prior to having the work completed.

Since the modular connection is now the most widely used in the United States, it is the type which is used in the VIDEOpal Order Recorder. If your home phone system already utilizes this type of connection, no modification is required. If your phone system incorporates connectors other than the modular type, they will need to be adapted. There are many sources of phone adapters (hardware stores, discount houses, electronics shops, etc.) and the change over is usually simple. You can install the adapters yourself, or, you may hire a telephone technician to do it for you.

Tools You May Need
The following tools may make it easier to prepare your non-modular telephone system for the VIDEOpal Order Recorder. Please note that they may not be required for your particular installation.

Hammer
Screwdriver – flat bladed (slot) or Phillips-type
Insulated staples
Tap-in clips
Staple gun & staples
Wire cutter
Wire stripper

Adapting 4-Prong Connections to Modular

There are three types of 4-Prong wall plates...
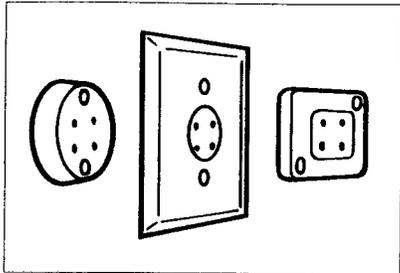
... and two basic ways of adapting the 4-Prong connector to accept a modular cable:
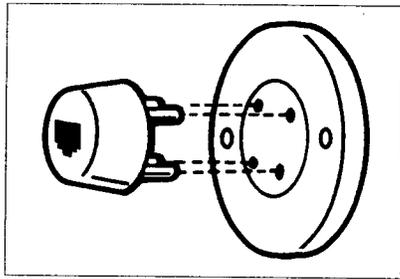
1) 4-Prong-to-Modular
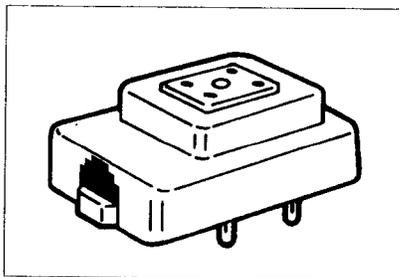
2) 4-Prong plus Modular

## Adapting Hard-Wired Connections to Modular

Hard-wired phone systems typically have a small junction box mounted down by the baseboard with the cord from your telephone connected directly to it. The actual connections are shielded beneath the cover. There are two ways to adapt this type of connection to accommodate the modular requirements of the VIDEOpal Order Recorder.
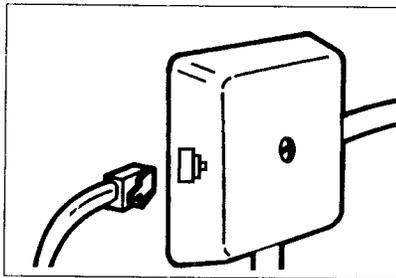
1) Purchase and install a non-modular outlet with integrated modular converter according to the instructions supplied with the unit (this will eliminate having to convert your non-modular phone if connected to the same outlet).
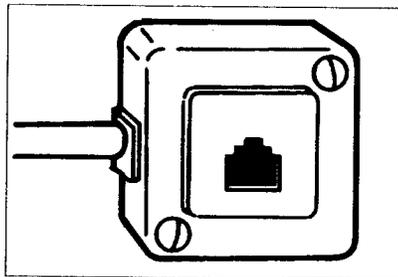
2) Purchase a surface-mounted modular converter. (By adding a modular duplex jack, you can plug in a modular phone as well as the VIDEOpal Order Recorder.)
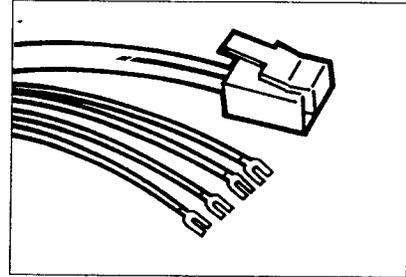
NOTE: Phone cables with a modular plug on one end and wire terminals on the other end may also be purchased. Follow installation instructions supplied with the cable. Once installed, you'll be able to connect the VIDEOpal unit directly to your phone system.

Connecting the VIDEOpal System to a Telephone Outlet

Once the proper modular outlet has been installed, connecting the VIDEOpal system is easy.
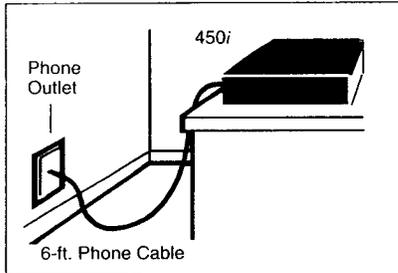
1) If your Innovation 450*i* is close to a modular phone outlet, connect the VIDEOpal system directly to the outlet using the 6-ft. modular phone cable supplied.
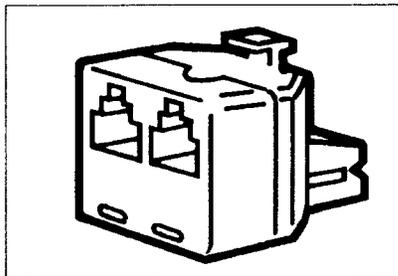
2) To connect a telephone to the same outlet, purchase and install a duplex phone jack (see above), or use the supplied 50-ft. modular phone cable with the duplex jack already attached (see below).
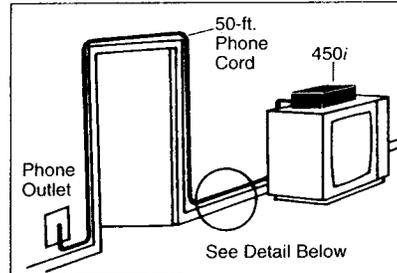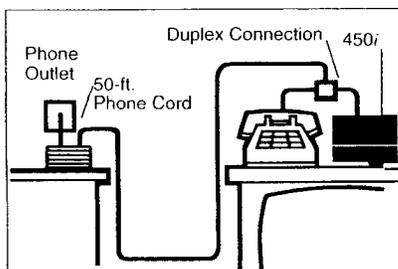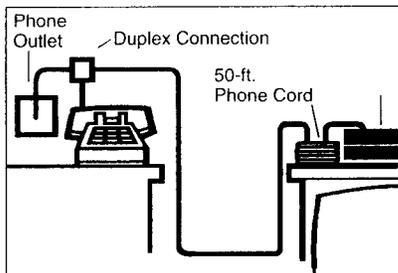
3) If a phone jack is not close to your INNOVATION 450*i* IRD, use the 50-ft. modular phone cable to make the connections. Be certain to route the cable clear of foot traffic or equipment that might damage it. Avoid running the cable under carpeting or rugs.

4) The cable may be secured along baseboards or around doorways using either a staple gun with the proper staples, or insulated staples that are tapped into place with a hammer. Be careful not to puncture the cable when using staples.
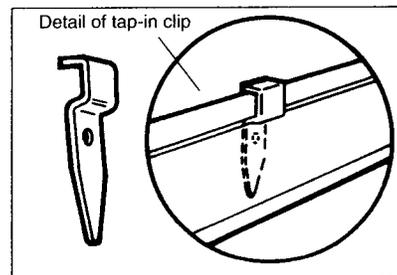
5) Tap-in clips can also be used to secure the cable to the baseboard.
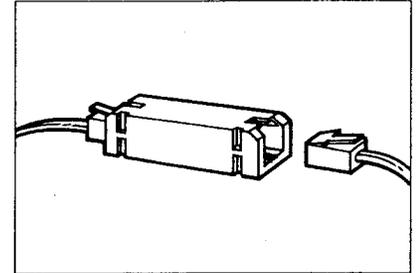
If your phone outlet is further away than the supplied 50-ft. modular phone cable will safely reach, you'll need to purchase and connect a second phone cord. A double female connector (also optional) will allow you to plug the two cables together easily.

This completes the installation steps.

▮ Troubleshooting Guide

BEFORE YOU CALL

Try the Troubleshooting Guide on the following pages. If you still can't solve your problem, try one more thing before you call.

1. Pull the Power Plug from the AC receptacle.
2. Wait 5 minutes.
3. Plug the Receiver back in and try your procedure again.

GETTING HELP

If you still can't correct an operating problem, contact your dealer. If your dealer is unable to solve your problem, contact General Instrument Customer Service. **Please don't open the cabinet and attempt to repair the unit, as this will void your warranty.** Unplug the receiver and refer servicing to qualified service personnel when:

▮ The power supply or plug is damaged.

▮ The receiver has been exposed to rain or water.

▮ A solid object or liquid has fallen into the receiver.

▮ The receiver exhibits a distinct change in performance or will not operate normally.

▮ The receiver has been dropped or the cabinet has been damaged.

MAINTAINING YOUR RECEIVER

The only maintenance that your receiver should require is an occasional dusting. *DO NOT* spray any liquids on the unit!

TO SERVICE THE RECEIVER

1. Customer Service may be reached at 1-704-327-2026 Monday through Friday, 8:30 a.m. to 8:30 p.m. Eastern Time.

2. Do not ship your unit to General Instrument until you are asked to do so. You will be given a Return Material Authorization (RMA) number that must be sent with your unit. We suggest you attach a piece of masking tape to the bottom of the unit and write the RMA number on it. Use this RMA number in all correspondence with General Instrument about your repair.

3. Label each wire and connector before disconnecting the receiver.

4. Ship the unit to General Instrument in its original packing box or an equivalent padded container. Pre-pay the freight to send the unit to General Instrument. We suggest that you insure it for its full value. Out of warranty repair costs will be billed to you C.O.D. Freight and handling charges may also be billed C.O.D. **See your Warranty Card for details.**

REPLACEMENT PARTS

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or those which have the same characteristics as the original part. Unauthorized substitutions may result in fire, electrical shock or other hazards.

SAFETY CHECK

After completing any service or repairs to this receiver, ask the service technician to perform safety checks to determine that the receiver is in proper operating condition.

PROBLEM:
Remote Control does not work.

SOLUTION:

■ Check to see if the LED above the VCRS indicator on the Innovation 450*i*'s front panel blinks when you press one of the remote control keys. If not, check the remote control's batteries.

■ Replace batteries.

■ If you are using the optional UHF remote, make sure that IRD is set for correct code (custom UHF or regular UHF). See the UHF Remote Control Owner's Manual.

PROBLEM:
No picture or sound.

SOLUTION:

■ Check all connections.

■ Make sure that the Innovation 450*i*, your TV and/or stereo system have power.

■ Make sure MUTE is not on (press MUTE on remote control).

·■ Make certain that the Innovation 450*i* and the TV are tuned to the same channel (Channel 3 or 4).

■ Try another channel.

■ Try another satellite.

■ Make sure that there is not a problem with the TV. Check off-air/cable operation.

■ If you are on a VCRS channel, check that you are authorized to receive it.

■ See "No Volume Control" on next page.

PROBLEM:
Signal strength at adequate level, but no picture or sound on any satellite.

SOLUTION:

■ Try another channel.

■ Try another satellite.

■ Check tuning of channel.

■ If you are on VideoCipher channel, check that you are authorized.

■ Check polarity (normal or reverse).

■ Check frequency band (C or Ku).

PROBLEM:
No stereo sound on VideoCipher channels.

SOLUTION:

■ Turn up volume on TV and IRD and make sure MUTE is off (use remote control).

■ Check a program guide to make certain program is broadcast in stereo.

■ Make sure that IRD is hooked up to stereo unit (or TV with two audio in-puts) correctly. (See Figures 5 and 6 on page 61 of this User's Guide.)

■ Make sure audio mode is in VC audio state ([MENU], [3], [4]).

PROBLEM:
Noisy picture or sound.

SOLUTION:

■ Try another channel.

■ Try another satellite.

■ Check tuning of channel, subcarrier audio, and audio bandwidth.

■ Realign antenna.

■ Check connections between receiver, LNB, polarizer, and coax relays.

■ Check your area for excessive Terrestrial Interference. Activate TI Filter.

■ Check that TV is set on either channel 3 or 4 (depending on which is selected on the IRD's back panel).

■ See "Poor Picture" on next page.

PROBLEM:
No VideoCipher LED.

SOLUTION:

■ Check tuning of channel.

■ Verify that you are on a VideoCipher channel.

PROBLEM:
Cannot watch VHF or cable.

SOLUTION:

■ Make certain that your Innovation 450*i* is in the TV mode [SAT/TV].

PROBLEM:
Cannot change channels.

SOLUTION:

■ Make certain that your Innovation 450*i* is in the correct mode [SAT/TV]. If OSD display changes channels, see information under "Problem: Remote control does not work."

■ Check Parental Control to see if all channels were locked.

■ Check that channel tuning is set for "STEP." See "Control Options" menu.

PROBLEM:
TV displays "NO SUBSCRIPTION" or TV displays black picture even though the VideoCipher LED is lit.

SOLUTION:

■ Call programmer to have your Innovation 450*i* authorized to receive signal.

PROBLEM:
TV displays "AUTHORIZATION NOT AVAILABLE."

SOLUTION:

■ Call programmer to have your Innovation 450*i* authorized to receive signal.

PROBLEM:
TV displays "PROGRAM BLACKED OUT."

SOLUTION:

■ Program is not available in your geographical area.

PROBLEM:
An asterisk (*) appears in corner of screen.

SOLUTION:

■ You have a message from your VideoCipher program supplier. See section on VideoCipher programming on page 28.

PROBLEM:
Lost Passwords.

SOLUTION:

■ If you forgot your VideoCipher password, call programmer to cancel old password and enter replacement.

■ If you forgot your Installation or Parental Control password, call General Instrument.

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PROBLEM:
Cannot switch from Normal to Reverse polarity.
SOLUTION:
▌ Go to PROGRAM SATELLITE menu, then press **[3]**, then use **[DOWN/UP]** arrow keys on the remote control to change format.

PROBLEM:
Poor audio on non-VCRS channels.
SOLUTION:
▌ Change audio bandwidth setting.
▌ Check that subcarrier frequency and audio mode are correct (use a program guide).

PROBLEM:
Dish does not move east or west or OSD says "ACTUATOR ERROR."
SOLUTION:
▌ Verify that east and west limits have been set.
▌ Check that IRD is wired to the terminal block correctly (see wiring diagram).
▌ Check that actuator wire is connected correctly at the dish.
▌ Check to make sure east and west limits are not set in the same location.

PROBLEM:
Receiver skips a channel.
SOLUTION:
▌ Check to see if Parental Control has been activated for that channel.
▌ Verify that IRD channel tuning is set for STEP (Press **[MENU]**, then **[5]**, then check line 3.)

PROBLEM:
OSD won't display clock.
SOLUTION:
▌ Press **[MENU]**, then press **[5]** for Control Options. Check line 1.

PROBLEM:
Clock displays incorrect time.
SOLUTION:
▌ Press **[MENU]**, then press **[1]** for Timer.
▌ Press **[5]** to adjust clock.
▌ Make sure that power to the IRD is not interrupted.
▌ If problem continues, your household AC current may be slightly off from the norm. This will make accurate time-keeping difficult over long periods of time.

PROBLEM:
Pulse count reads incorrectly and/or goes the wrong way.
SOLUTION:
▌ Make sure that wiring to M1 and M2 is not reversed.
▌ Check actuator jack.

PROBLEM:
No On Screen Displays (OSD).
SOLUTION:
▌ If you are using a monitor-type TV, check cable going from VIDEO OUT connector on rear panel of IRD to Video Input on the monitor/TV.

PROBLEM:
No volume control.
SOLUTION:
▌ Check that audio wiring is correct. Make sure that the correct AUDIO out-puts are being used to your stereo or monitor/TV.
▌ Make sure that volume on stereo and or monitor/TV is turned up as well as the IRD's volume.
▌ Check that MUTE is not on (press MUTE on remote control).

PROBLEM:
Timer did not come on as scheduled.
SOLUTION:
▌ Make sure that event or daily timer is SET so that timer will be enabled.
▌ Make sure that the event scheduled was not in conflict with another event.

PROBLEM:
Poor picture on every other channel.
SOLUTION:
▌ Skew may be set incorrectly for either all odd channels or all even channels. Adjust skew via AutoPeak® or Program Satellite menus.
▌ Adjust picture via AutoPeak or other options under Video Adjustment (**[MENU]**, then **[4]**). Try AutoPeak on an odd channel and then on an even channel and repeat several times if needed.
▌ If a Matrix switch has been installed on your system, check that it is wired correctly.
▌ Check that correct input configuration is set. Press **[MENU]**, then **[6]**, then check line 1.
▌ Make sure that rotor is working.

PROBLEM:
No power on IRD (no LEDs or displays).
SOLUTION:
▌ Check that unit is plugged in and press **[POWER]** on front panel or remote control.
▌ Make sure that IRD is not connected to a switchable wall outlet (with on/off switch).
▌ Press **[TIMER]** on front panel.
▌ As a last resort, press circuit breaker (labeled "CB") on back panel.

■ Important Telephone Numbers

The Satellite Video Center
800-54-VIDEO
(800-548-4336)

General Instrument
Consumer Hotline
704-327-2026

General Instrument Dealer

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Please write your Innovation 450*i*
serial number (found on the bottom
panel) and your VCRS Descrambler
unit address number (found in the
center of the back panel) in the
spaces below. You will need this and
the other information shown below if
you call General Instrument for
service or the Satellite Video Center
(or your billing center) for program-
ming authorization.

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Innovation 450*i* Serial Number

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VideoCipher Unit
Address Number

■ Specifications

INPUT FREQUENCY

Input Frequency	950 to 1450 MHz
Input Impedance	75 Ohm
Input Level	-65 dBm to -25 dBm
Noise Figure	12 dB maximum
No. of Channels	24 channels in C-band 32 channels in Ku-band
C/Ku Input Isolation	40 dB
Second IF Frequency	402.78 MHz
Bandwidth	27 MHz at 3 dB point
Built-in TI Filter	20 dB minimum
Threshold (static)	6.5 dB C/N maximum
Local Oscillator Leakage	Less than -50 dBm maximum
Demodulator	ILO demodulator

VIDEO

De-emphasis	525 line CCIR Rec. 405-1
Frequency Response	50 Hz to 4.2 MHz +1.1 dB to -1.3 dB maximum
Differential Gain	3% typical
Differential Phase	3° typical
Output Impedance	75 Ω
Clamping S/N	Better than 40 dB 46 dB min weighted at 16 dB C/N (10.7 MHz peak dev.)
Output Level	1 Vp-p into 75Ω
Attenuation	OFF: 0 dB ON: -3 dB

VHF OUTPUT

Impedance	75 Ω
Channel	CH 3 or 4
Level	6.5 dBmV ±3 dB from VHF modulator

AUDIO

Subcarrier Bandwidth	5.0 to 8.5 MHz 150 KHz narrow at 3 dB 330 KHz wide at 3 dB
Modes	Mono & Digital Stereo
Frequency Response	±1 dB, 20 Hz to 20 KHz in non-VC mode ±0.5 dB, 20 Hz 20 KHz in VC mode
De-emphasis Harmonic Distortion	75 micro sec. 0.2% maximum in VC mode 1.0% maximum in non-VC mode
S/N	80 dB minimum in VC mode, 50 dB minimum in non-VC mode at 9 dB C/N
Volume Control	(2 dB per step): 040 dB range; mute: ≥66 dB

BASE BAND OUTPUT

Frequency	5.0 Hz to 8.5 MHz
Output Impedance	75 Ω

Output Level	1V p-p into 75Ω

PHYSICAL/ ENVIRONMENTAL

Temperature	0° to 40° C ambiant
Humidity	95% relative
Dimensions	17" W x 4-1/16" H x 13-7/8" D
Weight	21 lb., 6 oz.
Power Input	115V ± 10% AC 60W Nominal 300W Maximum
UL	Listed
CSA	Certified

REMOTE CONTROL

Internal	Infrared range 21 ft.
Batteries	2 x AAA
Optional	UHF kit model no: URK-45 Flash Card™ 16 key infrared remote

Features, functions and specifications are subject to change without notice.