

# CodeRunner 4

Analog / Digital Central Receiver



## Applications

- Central receive system for digital and/or analog electronic news gathering operations
- Ideal for news operations facing narrower channels
- Designed to support a wide range of application-specific central receive antenna systems for MRC's steerable, sectorized, or omnidirectional antennas.

## FEATURES

- Companion receiver to the CodeRunner 2 analog/digital transmitter
- Operates in 2 GHz, 7 GHz, or 13 GHz bands with multiple band operation possible
- NTSC/PAL Audio/Video demodulation with four field upgradable frequency agile audio subcarriers
- COFDM, QPSK and 16 QAM auxiliary IF outputs from external modulators
- Supports MRC's wide range of steerable, sectorized, and omni-directional antennas
- Electronic display and control of all system operating parameters
- Menu System provides custom channel plans for future channel bandwidth changes
- Selectable IF operating bandwidths

The CodeRunner 4 combines the features of a high performance analog and digital central receiver. Like the CodeRunner 2, the radio can be upgraded from legacy NTSC/PAL to a digital receiver capable for accepting COFDM, QPSK, or 16QAM modulation. The receiver can be locally or remotely switched between analog or digital operation.

MRC has engineered the CodeRunner 4 to meet the demands of future bandwidth requirements and frequency stability with the following design features:

- For enhanced adjacent channel rejection, modulation and channel plan specific bandpass filters for superior receiver selectivity and adjacent channel performance with optional 10 MHz SAW Filter
- Utilizes synthesizer technology developed for the DAR and TwinStream digital systems
- Optimized baseband circuits with video lowpass filter
- Proprietary narrow band subcarrier receiver optimized for successful analog FM operations in narrower RF bands
- Ultra-low phase noise sources, with unprecedented stability and quality
- Proprietary implementation of MRC's extremely stable, low-noise oscillator technology
- RF chain operating center frequencies are field upgradeable to potential new RF frequency band plans

The CodeRunner 4 menu system reports operating parameters and system conditions on multiple line front panel display. To meet future bandwidth requirements, you can now create custom channel plans using the new Channel Plan Menu.

CodeRunner 4 provides seamless integration with the MRC 2000 Steerable or Sectorized Controller along MRC's array of steerable, sectorized, and omnidirectional antennas.

CodeRunner 4 now offers field upgradable frequency agile audio subcarriers.

### Customized 4 Menu System

The CodeRunner 4 Menu System provides system control and alarm reporting locally from the front panel, or from a remote location. You can easily navigate between menus to change system settings.

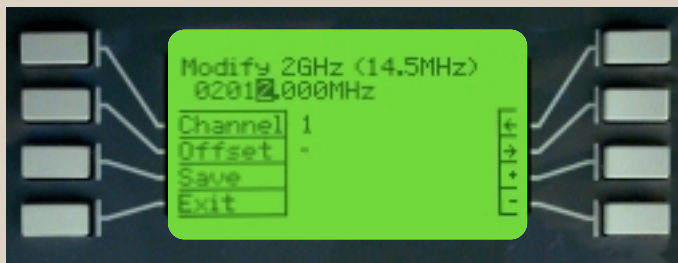


#### Front Panel Active Display

- Receive Signal Level (RSL)
- Band, Channel, and Offset
- Analog or Digital mode
- Channel Bandwidth (12, 14, or 17 MHz)

### CodeRunner 4 Channel Plan Menu

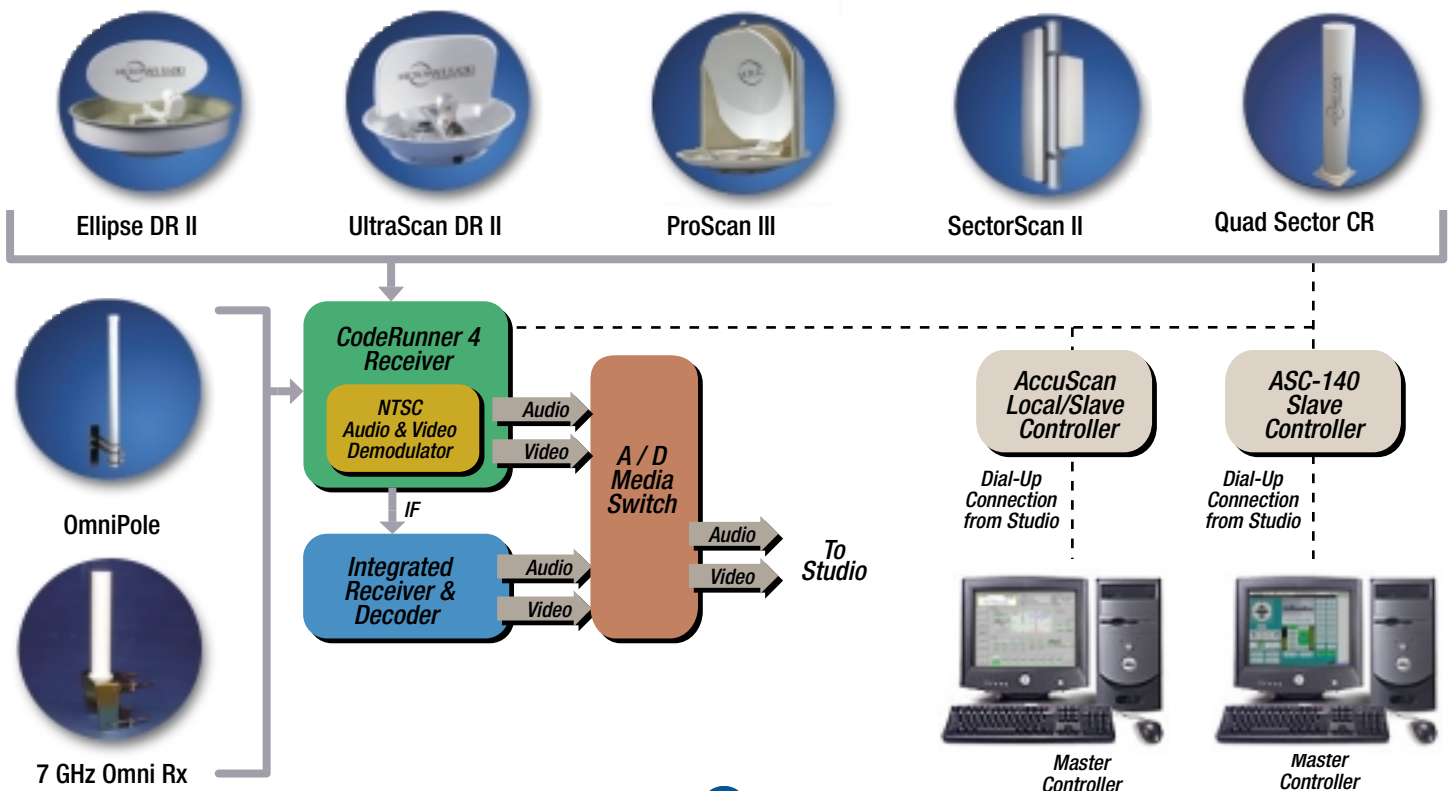
To prepare for coming changes in allocated bandwidth, the new Channel Plan Menu lets you create customized channel plans for 12, 14.5 or 17 MHz bandwidths. Set the frequency and offset and save your settings. Channels can easily be recalled and changed. Also you can create custom plans for each bandwidth.



### CodeRunner 4 Menu Features

Display Screen	Frequency, Channel, Band, Offset, Receive Signal Level (dBm), IF Bandwidth (Narrow, Normal, Wide), Channel Plan (14.5 or 17 MHz), Local or Remote Control, Analog or Digital Mode, Scrolling Message Bar
Remote Control	Transmit/Receive Baud Rate, Parallel Port (Enabled/Disabled), Serial Port (Enabled/Disabled)
Contiguration	Screen Contrast, Backlight On/Off
Channel Plan	Set Channel, Offset, Save Settings
RF T ray	Set Channel, Band, Offset, IF Bandwidth (Narrow,Normal, Wide), Channel Plan (14.5 or 17 MHz), Local or Remote Control, Analog or Digital Mode
Power Supply	+15Vdc, -15Vdc, and +5Vdc Current, Minimum, Maximum Readings
Digital Demodulator	Internal or External Modem, Analog or Digital Mode
V ideo Demodulator	Set Squelch, Squelch Trip Point, Status, Mode
Audio Demodulator	Modulator Mode, Status

### Central Receive Antennas and Controllers



## CommandScan Master Controller



- Standard Control System for all new ASC-140 Slave Controllers
- Upgrade Control System for MAC-100 and MAC-1000 Master Controllers
- Compatible with MRC and Wescam helicopter antenna pods
- Easy to use graphic user interface
- Color Signal Strength, and BER (bit error rate) "BER" displays
- Control up to 8 any number of sites with 1 master
- May be installed onto any computer running Windows 95/98/NT/2000 (2000 Professional – standard)
- Multiple computers can be networked for distribution of control
- Antenna and Receiver Controls and Indicators
- Antenna positioning Azimuth & Elevation
- Antenna selection for SectorScan Systems
- LNA Gain Reduction
- NAVTRACK (Helicopter Tracking System)
- Venue Presets
- Received Signal Level (AGC)
- BER (bit error rate)
- Receiver Channel and Band Selection

## AccuScan Master Controller



- Compatible with MRC and Wescam aircraft antenna pods
- Models available to control UltraScan, ProScan, SectorScan, Quad Sector and Ellipse receive antenna systems
- Can be configured to control any MRC central receiver via parallel or serial interface
- Built-in latitude and longitude location distance, and receive site calculator with "Go-To" antenna control function
- GPS based optional autotracking control system
- Automatic LNA gain control for receiver overload protection
- New ProScan III "realtime" troubleshooting and diagnostics
- Master Control Software with backward compatibility to legacy MRC 2000 local/slave controllers
- Touch Screen option available
- Control up to 4 sites with 1 master
- Dual slave expansion kit for 2nd antenna and central receiver at the same site
- Color coded Bit Error Rate "BER" display
- Compatible with Windows 98, 2000, & XP
- User selectable password setup detection



*ASC-140 Slave Antenna Controller*



*AccuScan Local/Slave Antenna Controller*

