



## FEATURES

- Controls up to 64 Channels of Data, each Channel Consisting of a Tuner, Demodulator and Display
- Full Color Presentation for Operator Convenience
- Built-In-Test (BITE)
- Self-Initializing—Identifies what remote devices are included in the system
- Menu-Driven Display provides easy user interface

## DESCRIPTION

The SMR-1611 Controller is the operator interface to the SMR-1600 Synthesized Microwave Receiving System. A sixteen-bit microprocessor provides instructions to the user with no need for reference to a manual or pull-out card. A color CRT helps the operator to quickly locate different types of data on the CRT. Red is used for failure messages, dark blue is used to indicate channel status, and light blue is used to indicate programmable options. Yellow is used to identify illegal commands programmed by the user.

The controller consists of a digital display plus keypad and optical encoder controls. All elements of the SMR-1600 system, regardless of complexity, may be controlled by a single SMR-1611. This includes SMR-1615 Interface Units, SMR-1629, and 1660 Tuners, SMR-1635/1636 IF/Demodulators, SMR-1641 Digital Scan Displays and SMR-1651 Switch Matrices. Up to four SMR-1611 Controllers

are permitted within the system, each having the ability to control any unit within the system.

The color digital CRT in the Controller displays three different but related presentations. This provides the operator with a technique to quickly monitor a large number of channels and modify parameters desired. Two screen modes may be selected by depressing the appropriate special function key adjacent to the CRT. The "STAT" key can select one of the two status displays: "CAPABILITIES" which shows tuner ranges and SMR-1635 collection demodulator bandwidths available; and "PRESENT" showing the actual tuner frequencies and bandwidths selected for both collection and analysis demodulators. These two displays are selected by repeatedly toggling the "STAT" key.

The lower section of the CRT is reserved for error messages which may affect system operation. Channel scrolling is accomplished utilizing the up and down keys located to the right of the display.

A second screen mode may be called up depressing "PROG" which allows the operator to reprogram the various parameters for the selected channel. Detailed information concerning one channel is displayed in a column format on the left side of the screen. The right side is reserved for user prompts and data selection.

## STATUS (CAPABILITIES) MENU

This display summarizes the collection bandwidths and frequency coverage of the devices in the system. Cursor up/down keys or the optical encoder may be used to scroll through the channels assigned in the system.

## STATUS (PRESENT) MENU

The current status of each channel is tabulated on this display. This includes frequency assignments or sweep limits of all the tuners in the system and selected bandwidths for analysis and collection demodulators. The operator may use the cursor up/down keys or the optical encoder to "scroll" through all the channels assigned in the system.

## PROGRAM MENU

The program menu is the primary operating mode of the SMR-1611. The operator may examine the current parameters of any channel (up to 64), change the parameters of every device on the system, and be notified of any errors in the system or in individual devices. The long cursor on the left side of the screen is used to identify a parameter that the operator wishes to change. The cursor on the right side of the screen is used for the selection of parameters values.

## SERVICEABILITY

The SMR-1611 Controller has Built-In-Test (BITE) ability to permit the operator to easily check operation of all the instruments in the system, and locate failures.

Automatic BITE testing is performed with serial polling of all of the instruments in the system and, in the event of a failure, a red error message is displayed on the bottom two lines of the CRT display. The "TEST" special key accesses a table displaying the type of error (i.e. voltage, phase lock, high temperature, etc.) and the faulty device. A series of additional tests may then be performed with the controller to further isolate the nature of the failure.

The BITE Capability designed into SMR-1600 system includes the following tests, all of which may have results displayed in the manual mode:

TEST	UNITS TESTED
All Power Supply Voltages	All Instruments in System
Phase Lock Conditions	All Tuners & Demodulators
Battery Conditions	All Tuners, Demodulators, Video Switches, Displays, Interface Units
Internal/External Reference	All Tuners & Demodulators
Internal Temperature	All Tuners, Interface Units, and Controllers
Tuner First IF Test Signal	All 1629 Tuners, Demodulators, Video Switches, Displays
System MAP	Communications of all units in system

Another built-in feature provides the ability to monitor and log actual operating hours through the resident microprocessor. This permits easy verification of usage and system reliability data.

## INITIALIZATION

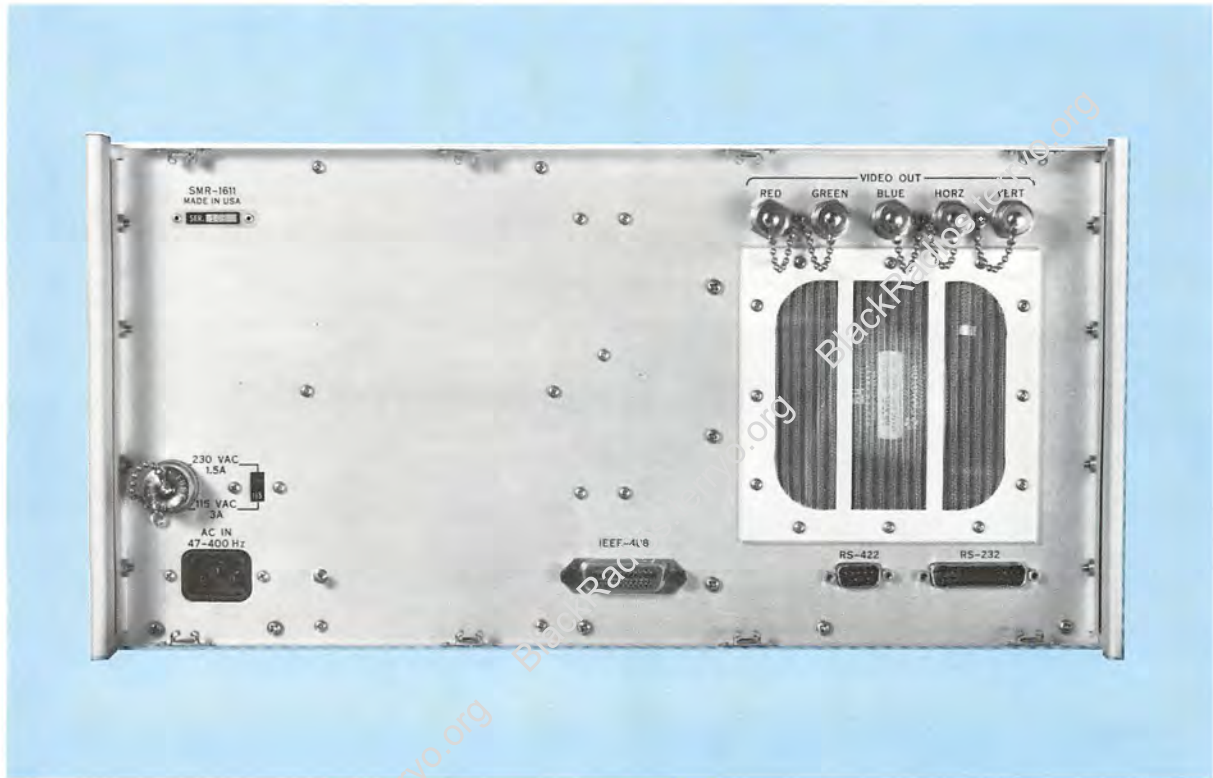
The SMR-1600 System has the unique ability to recognize all system capabilities present. This is accomplished with an initialization routine activated by depressing the "INIT" special function key. This command polls every unit to discover what is connected to the system, what the addresses are, and then loads the parameters into the controller memory. The operator may then view the "PROGRAM" menu to determine which demodulators, tuners, etc. are used in each channel along with the bandwidths, frequencies and other important information.

## SYSTEM ERASE

All mission parameters in all devices may be erased with the "ERASE" special function key to preserve security. A two stage process eliminates the possibility of accidental erasure.

## SYSTEM CONFIGURATION

Each Controller is connected to an SMR-1615 System Interface Unit and all communications from the Controllers are applied through the SMR-1615 to the other instruments in the system. The connection between the controller and system interface unit is via an RS-422 cable. External computer control of the system may be exercised via the IEEE-488, RS-232C or RS-422 Interface Bus within the SMR-1611.



## SMR-1611 CONTROLLER, SPECIFICATIONS

Units Controlled via SMR-1611 .....	(1-64) SMR-1629 or SMR-1660 Series Microwave Tuners (1-64) SMR-1636 IF/Demodulators (1-8) SMR-1638 Analysis Demodulators (1-16) SMR-1641 Scan Displays (1-8) SMR-1651 Switch Matrices
System Instrument Interface .....	RS-422 (Serial)
External Computer Interface .....	IEEE-488 (Option 1) or RS-232C (Option 2), RS-422 (Option 3)
System Status Presentation .....	Digitally Refreshed Color CRT Also connections on rear panel to attach to an RGB type external monitor
Display Colors .....	Red, Green, Blue, Yellow, Cyan, Magenta, Black, White
Display Area .....	6.3" (W) × 4.7" (H)
Data Entry .....	Keyboard and Optical Encoder
Temperature .....	0 to 50°C
Cooling .....	Forced Air
A/C Power .....	15/230 Vac ± 10%, 47-420 Hz, 150 watts nominal
Size .....	8.75" (H) × 17" (W) × 17" (D)
Weight .....	35 pounds, nominal

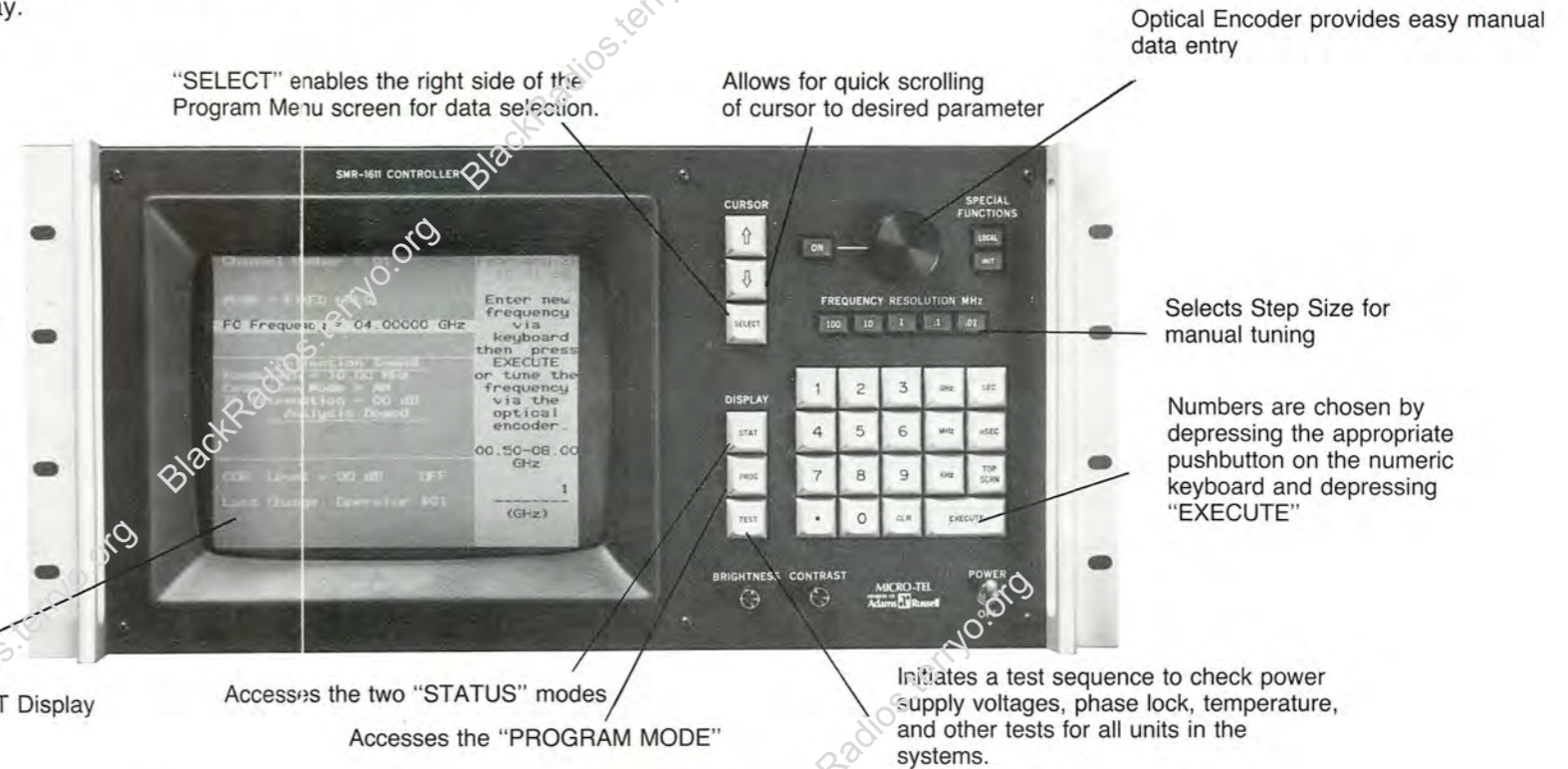
One of the following must be specified:

- Option 1: IEEE-488 Interface
- Option 2: RS-232C Interface
- Option 3: RS-422 Interface

Channel Number = 01	Display Number = 00	Enter new frequency via keyboard then press EXECUTE
Mode = F1 - F2		
F1 Frequency = 04.00000 GHz	F2 Frequency = 07.00000 GHz	
Marker Freq = 06.00000 GHz		or tune the frequency via the optical encoder
Collection Demod		(00.5-18.0 (GHz))
Bandwidth = 10.0 MHz	Detection Mode = FM	
IF Attenuation = 10 dB	Analysis Demod *	(GHz)
Bandwidth = 00.2 MHz	Detection Mode = FM	
IF Attenuation = AGC		
Sweep Time=0100mS	SWP'G	
Threshold = 10 dB	OFF	
Last Change: Operator #00		

## PROGRAM MENU

Allows parameter values to be modified easily. Current value parameters are presented on the left side of the display. User prompts including instructions and choices of parameter values are presented on the right side of the display.



## STATUS MENU (PRESENT)

Allows instantaneous view of current frequency assignments and bandwidth of both the collection and analysis demodulators for 18 channels at one time.

CH	OP	FREQUENCY (GHz)	SW	ANAL
#		(% =sweep stopped)	COLL/ANAL	
1	00	04.00000	10.0	00.
2	00	00.55000	20.0	00.
3	00	01.70000	05.0	01.
4	00	02.20000	10.0	02.
5	00	05.76000	01.0	05.
6	00	08.00000	02.0	10.
7	00	12.80000	20.0	20.
8	00	18.00000	50.0	40.
9	00	31.00000	10.0	00.
0	00	01.50000	01.0	00.
1	00	12.00000	20.0	01.
2	00	04.00000	05.0	02.
3	00	02.00000	10.0	05.
4	00	27.50000	02.0	10.
5	00	00.65000	50.0	20.
6	00	08.90000	10.0	40.
7	00			
8	00			

## STATUS MENU (CAPABILITIES)

Allows the user to view the system capabilities in an instant. Displays current status of up to 18 receiver channels simultaneously including channel number, tuner frequency, range and available bandwidths in the SMR-1635 Tuner.

CH	CAPABILITY (MHz)				FREQUENCY CAP. (GHz)
01	01.0	05.0	10.0	20.0	00.5 18.
02	01.0	05.0	10.0	20.0	00.5 01.
03	01.0	05.0	10.0	20.0	01.0 02.
04	01.0	05.0	10.0	20.0	02.0 04.
05	01.0	05.0	10.0	20.0	04.0 08.
06	01.0	02.0	05.0	10.0	08.0 12.
07	01.0	02.0	05.0	10.0	12.0 18.
08	01.0	02.0	10.0	20.0	18.0 26.
09	01.0	05.0	10.0	20.0	26.5 40.
10	01.0	02.0	05.0	10.0	01.0 02.
11	01.0	02.0	10.0	20.0	12.0 18.
12	01.0	02.0	05.0	10.0	04.0 08.
13	01.0	05.0	10.0	20.0	00.5 18.
14	01.0	02.0	05.0	10.0	26.5 40.
15	02.0	05.0	10.0	20.0	00.5 01.
16	01.0	05.0	10.0	20.0	08.0 12.
17					
18					

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## WARRANTY

All Micro-Tel products are unconditionally warranted for a period of one year except for physical damage, provided the equipment is returned to the plant in Hunt Valley.

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