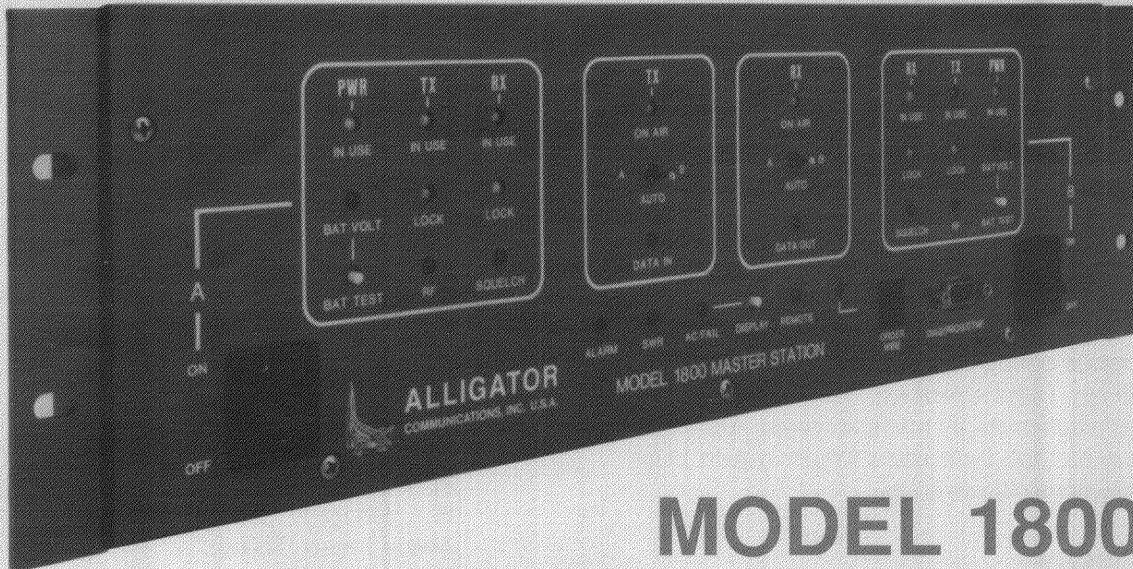


ALLIGATOR
COMMUNICATIONS, INC. U.S.A.



MODEL 1800 MASTER STATION RADIO

Exhibit 2

Features

- Frequency Agile
- Over-the-Air Control of Remote Radios
- Warm Standby
- Advanced Diagnostic Software
- Unique Design Occupies Only 5.25" of Rack Space
- Dial-up Phone Access
- Two Year Limited Warranty

General Description

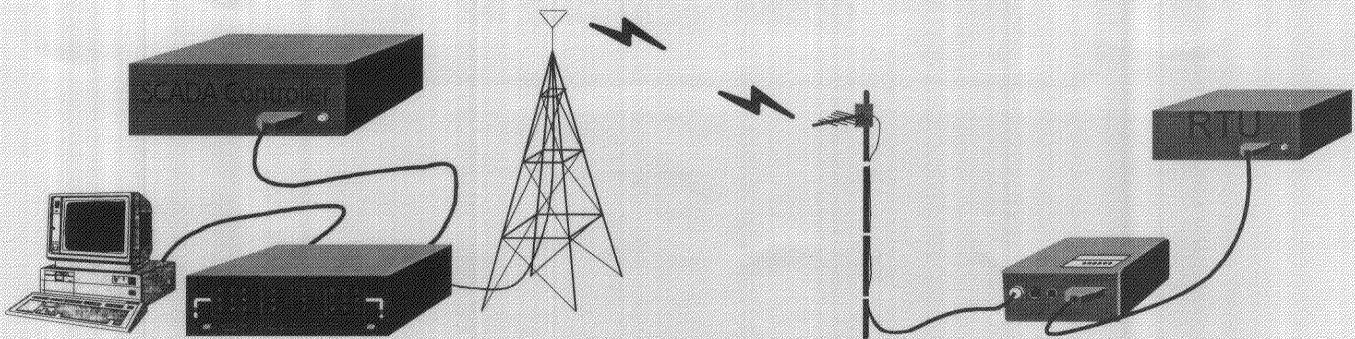
The Model 1800 is a microprocessor controlled frequency agile transceiver. Its transmitter and receiver can access all FCC assigned multipoint radio frequency pairs. The radio's completely redundant architecture also includes a duplexer, internal batteries, and automatic/manual changeover capabilities. All this in a case that occupies only 5.25 inches of rack space. The master station may operate as the status, diagnostic, and/or control center for a multiple address radio system. Also, a technician using the available Alligator Advanced Diagnostic Software may routinely diagnose and calibrate all Alligator remote radios over-the-air.

Applications

- Utility Data Communications
- Railroad Data Communications
- Oil and Gas Pipeline Monitoring
- Water Systems
- SCADA Systems

Implementation

Alligator designed the Model 1800 radio to operate as the master station of a Multiple Address Radio System (MARS). Such radio systems are commonly used for remote data acquisition and systems control. A typical radio system would include a single master station and multiple remote radios. The master station connects to a local data acquisition computer or systems controller either directly, via telephone line, or via microwave link. A 4 wire VF interface module is available to simplify installation of remotely monitored Model 1800 radios. Each remote radio connects to a Remote Terminal Unit (RTU) that collects data or enacts received control signals. This radio network forms the basic model of a Supervisory Control and Data Acquisition (SCADA) system. More complex systems include multiple master stations, repeaters, or polling remotes. The Model 1800 radio is configurable to fulfill each one of these roles.



Frequency Agile

The master station is programmable to all multipoint channels with any Tx/Rx separation. This feature minimizes the requirement for multiple spares. Also, a technician may program the master's frequency pairs in the field by simply setting dip switches.

Warm Standby

The master station offers a warm standby mode of operation without compromising auto-switching performance. This mode eliminates interference from the standby transmitter and lowers overall power consumption.

Advanced Diagnostic Software

This optional software is designed to run on an IBM PC/AT or PC/AT compatible computer connected to Model 1800 radio. The PC may connect to the master station locally, via a telephone line, or via a microwave link; without the use of modems.

Running this software, a PC may monitor and report the Model 1800's performance. Using the software provided commands, a technician can display a graphic representation of the front panel, remotely select the transmitter, and perform a battery test. The software can also display any of the following parameters:

Master Station Parameters (A and B):

RF Out Supply Current
Supply Voltage

Remote Signal Status:

RSSI Frequency Offset
FM Deviation

The software also monitors and modifies the operating parameters on Alligator's Model 1888 remote radios. The user may access the radio's parameters over the RF path. Therefore, changes to a remote radio's operating parameters or sleep mode routine does not require a trip to

the remote site. The software can display and/or modify the listed parameters:

Diagnostic Parameters:

Alarm Status	RSSI
RF Power Out	Supply Voltage
Reverse Power	Forward Power
PLL Voltage	Internal Temperature

Alarm Limits (Hi/Lo):

Supply Voltage	PLL Voltage
Reverse Power	Forward Power
Internal Temperature	

Operating Parameters:

Frequency	Dekey Time
Time-out Timer	RTS/CTS delay
VOX Enable	PTT Enable
Tx AFC	Rx AFC
Radio Address	RF Power Output

Counters:

Squelch	PTT
Time-out	

Sleep Mode Parameters:

Clock	Sleep Enable
Wake-up Time	Sleep Time
Wake Duration	Snooze Duration
Maintenance Enable	Start Time
End Time	

Over the Air Control of Remote Radios

The available Alligator Advanced Diagnostic Software allows direct over-the-air access to the operating parameters and diagnostic measurements of all remote radios responding to the connected Model 1800. A PC may report the current status of one or more Alligator remote radios, or modify the operating parameters of a specified remote. With a user assigned password, a technician can change all of the previously listed operating parameters, alarm limits, transmitter power output, remote address, and sleep mode timers. This remote monitoring and control of a system's remote radios enables a technician to diagnose and correct potential problems before they cause a remote to become unresponsive. The

technician may also perform routine frequency checks and adjustment without visiting the site of a single remote radio. With the available telephone dial-up interface module installed on a model 1800, a technician can perform all of these changes from any location in the world with telephone access. This dial-up capability also allows the technician to contact the factory and obtain assistance in trouble shooting the system by direct phone link.

Compact Design

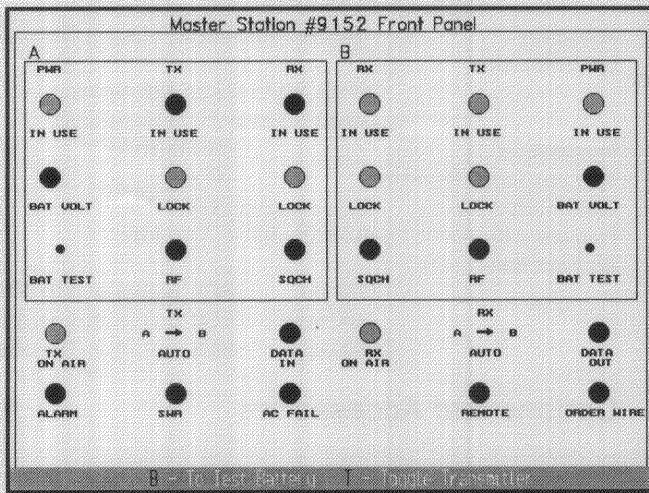
The master station's front panel is designed to quickly convey the operational status of all sub-assemblies. The slide guided removable front panel provides easy access for adjustments and the removal of sub-assembly modules

without having to remove the unit from its rack mounted position. The entire redundant master station assembly requires only 3 IRE rack units.

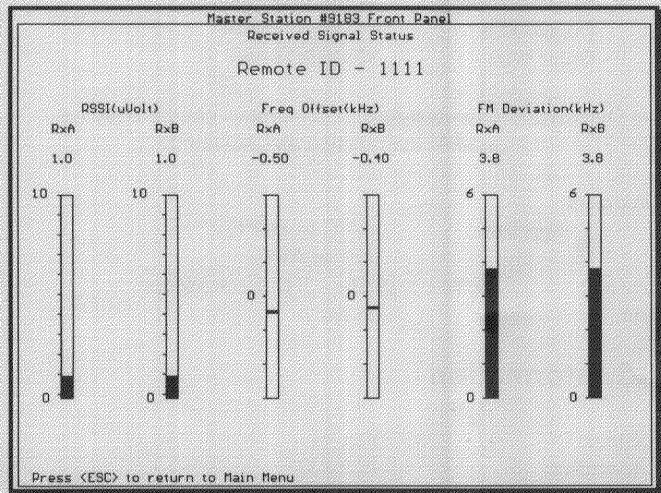
Analog or Digital Interface

The 1800 is available with two different signal interface options. The standard analog signal interface is capable of handling audio circuits such as voice or modem data (up to 9600 bps). The optional digital signal interface provides up to 9600 bps throughput, direct modulation of the transmitter VCO, and is capable of handling RS-232, RS-422, or TTL data.

Alligator Advanced Diagnostic Software



Front Panel display command allows users to switch transmitters and perform a battery test via phone line or microwave link.



Received Signal Status command continuously updates information regarding a user specified group of radios.

Master Remote Sleep Utility Exit Master Id #9152				
Real Time Diagnostics				
Remote Address :	1111		Low	Hi
Supply Voltage:	12.5	Volts	11.5	16.0
Internal Temp.:	38.9	C	-38.0	68.0
RSSI :	5.6	uV	N/A	N/A
	-92.1	dBm	N/A	N/A
PLL Voltage :	4.4	Volts	1.0	6.0
Forward Power :	4.8	Watts	1.0	6.0
Reverse Power :	0.2	Watts	N/A	4.0

Polling

(Esc) to exit

Real-time Diagnostics command continuously updates remote radio operating parameters. Alarm limits are user programmable.

Master Remote Sleep Utility Exit Master Id #9152									
Remote Diagnostics									
Addr	RSSI	RSSI	RF	FWD	REV	SUPL	PLL	INT.	
	uV	dBm	OUT	PWR	PWR	VOLY	VOLY	TEMP.	
1111	5.6	-92.1	MAX	4.8	0.2	12.5	4.4	38.0	
1112	17.7	-82.3	MAX	4.5	0.1	12.1	4.5	31.5	
1113	12.5	-84.9	HI	2.3	0.1	11.8	4.3	28.9	
1114	4.4	-94.5	MAX	4.9	0.2	12.8	4.1	29.5	
1115	2.8	-98.0	MED	1.2	0.0	11.9	4.4	29.8	
1116	11.2	-86.1	HI	2.2	0.1	12.1	4.3	30.1	
1117	28.1	-80.8	MAX	4.9	0.1	12.3	4.4	30.9	
1118	25.1	-79.2	MED	1.2	0.0	12.4	4.4	30.5	
1119	15.8	-83.3	MIN	0.6	0.0	12.6	4.5	29.2	
1120	18.1	-86.9	MIN	0.5	0.6	13.2	4.4	31.2	
1121	18.0	-81.7	MAX	5.0	0.2	12.2	4.4	32.0	

(F1) to update table (Esc) to exit

Remote Diagnostics command polls a user specified group of radios and displays their diagnostic parameters in single table.

1800

Specifications

General

Frequency Agility: 895-960 MHz*
350-512 MHz
Channel Spacing: 12.5 or 25 kHz
Data Rate: 300 to 9600 BPS
Input Voltage: 110/220 Vac
12, 24, 48, 125 Vdc Optional.
Input Power: 60 Watts
Transient Protection: 2500 V Isolation on VF
Input/Output, Keying, Alarm
and Power Circuits.

Connectors:

Antenna	Type N Female
Modem	DB-25
Diagnostics	Modular
Phone Line	Modular
Alarm Outputs	Terminal Block
External Battery	Terminal Block
Diagnostics	Modular (front)
Order Wire	Modular (front)

Alarm Outputs: One each form C dry contact closure relay for module malfunction and AC failure.

Environment:

Temperature: -30°C to +60°C
Humidity: 95% at 40°C

Dimension: 19"W x 5.25"H x 17"D, Rack Mount

Weight: 35 lbs

*FCC Information

FCC Rules: Part 94
FCC Identifier: JIL1800
FCC Emission Designators:
12K5F1D 25K0F1D
11K0F2D 16K0F2D
12K5F3D 20K0F3D

Contact factory for other frequency bands and power levels.

Transmitter

RF Power: 5 Watts (Adjustable: 0.1 to 5.0 Watts)
Impedance: 50 Ohms
Duty Cycle: Continuous
Transmitter Attack Time: < 1 msec
Frequency Stability: 0.00015% (1.5ppm) -30°C to +60°
Modulation Deviation:
12.5 kHz Band: ±3 kHz
25 kHz Band: ±5 kHz
Spurious and Harmonic Emissions: -65 dBc
Audio Input Levels: -25 to +10 dBm, Adjustable
Frequency Response: +1/-3 dB; 300 to 3000 Hz

Receiver

Type: Double Conversion Superheterodyne
Frequency Stability: 0.00015% (1.5ppm) -30°C to +60°
Sensitivity: -117 dBm (0.3 micro volts)
12 dB SINAD
Selectivity: -100 dB Minimum at Adjacent Channel
Desensitization:
-65 dB (EIA) at 12.5 kHz Spacing
-70 dB (EIA) at 25.0 kHz Spacing
Intermodulation: -75 dB (EIA)
Spurious/Image Rejection: -85 dB
Audio Output Levels: -20 to +6 dBm, Adjustable
Frequency Response: +1/-3 dB, 300 to 3000 kHz
Bit Error Rate:
1200 bps: BER 1x10⁻⁶ at -110 dBm
4800 bps: BER 1x10⁻⁶ at -110 dBm
9600 bps: BER 1x10⁻⁶ at -108 dBm

Options and Accessories

Modems:

1200 BPS, Bell 202 Compatible: RS-232
300-4800 BPS, Auto-Select, Asynchronous operation;
Digital Interfaces - RS-232, RS-422, or TTL
4800, 9600 BPS, Asynchronous or Synchronous
operation; Digital Interfaces - RS-232, RS-422, or TTL

Interface Modules:

Dial-up Interface Module
4 Wire VF Interface Module
PC to DTMF Converter

Alligator

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